

**Key Industry and  
Competitive Trends  
Affecting the  
"Computer Utility"  
Market**

**INPUT**



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# **Key Industry and Competitive Trends Affecting the "Computer Utility" Market**

Peter Cunningham  
INPUT  
June 2, 1989

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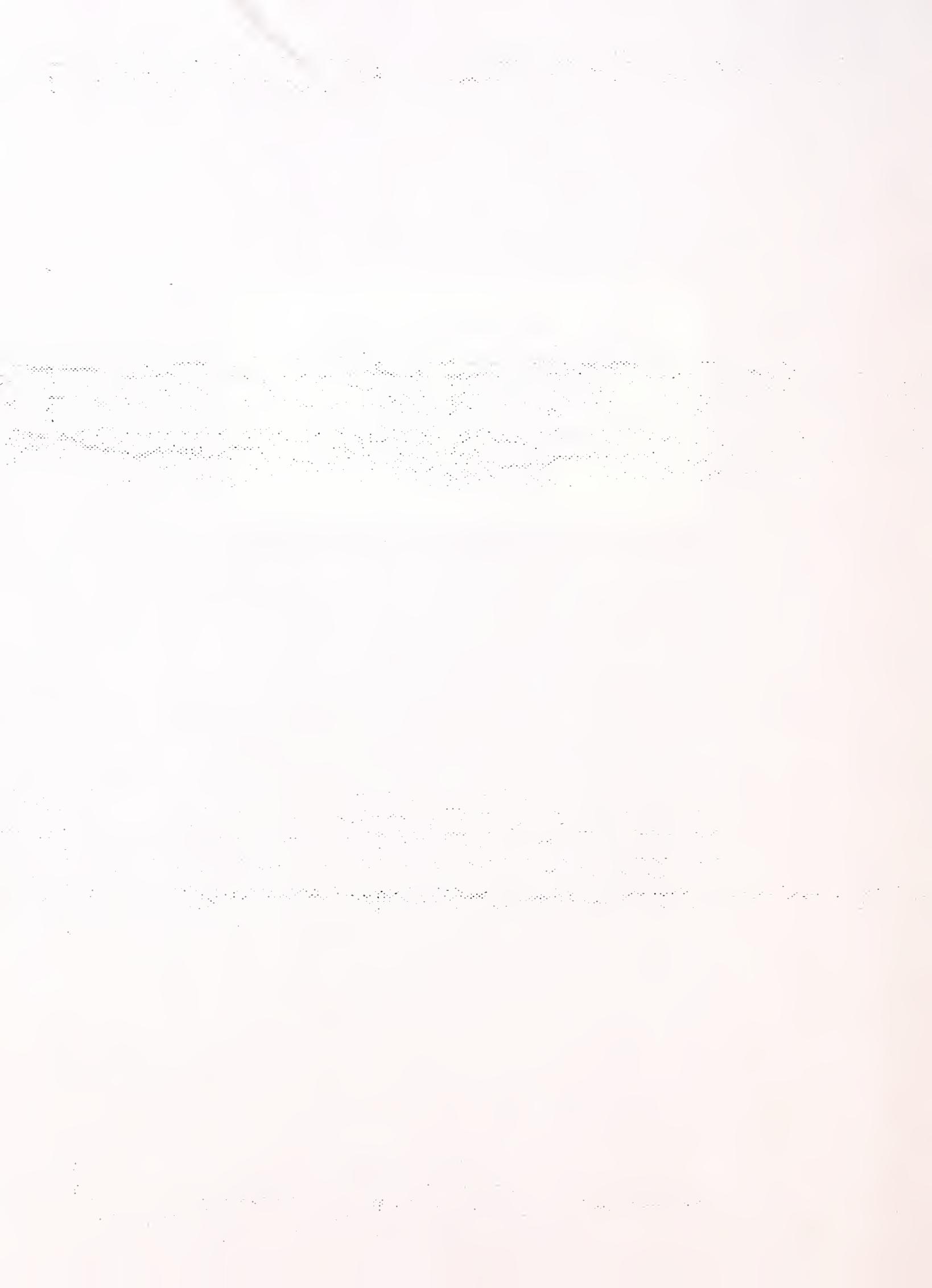
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Notes:



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## I. Introduction

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# Scope

- Identify key trends affecting:
  - "Computer Utility"
  - EDS's facilities management business
- Identify competitive changes and trends

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## Scope

- Identify other trends in:
  - Industry buyer characteristics
  - Hardware/software technology
- Emphasis is on the U.S.; European, and Japanese trends are considered secondarily

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## Method

- Use INPUT's existing studies and industry knowledge
- Pull information and analysis together in 3 days
- Prepare presentation with commentary

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Notes:

## Scope

- Particular subject requirements of EDS:
  - Market size and potential for the "computer utility" service
  - Key characteristics of target markets and prospect companies
  - Characteristics of buyer's decision criteria
  - Relationship viewed by prospect
  - Competitive impact on EDS's traditional business

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Notes:

## Scope

- These subjects could only be addressed in the time and price by producing "opinion" charts
- These questions require original work to answer properly
- "Opinion" charts are contained primarily in the "Conclusion" section

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Notes:

## Terminology

INPUT has replaced "Facilities Management" (FM) with the term "Systems Operations" (SO). It is a more accurate description and more acceptable term.

We will also use the term, Commercial Systems Integration (CSI) to describe non-federal government systems integration.

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Notes:







## II. Competitive Environment

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## Key Trends for the 1990s

- Products & Services Markets Blurring
- Changing Market Structure
- Internationalization
- Standards
- Vendor Reactions

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**NOTES:**

These are key trends affecting the competitive environment for information services generally and specifically for operations markets.

# Products & Services Markets Blurring

*Traditional Competitors Are Changing:*

- Traditional Product Companies Adding Services
- Traditional Service Companies Adding Products  
(Arthur Andersen, Peat Marwick)

*New Competitors Emerge with "Solution Services"*

- McKesson
- AMR
- John Deere
- Weyerhaeuser
- Bechtel
- CNB

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## NOTES:

- All hardware and software companies that deal with users directly are adding services businesses; primarily these are professional services, but also include systems integration and operations/processing services.
- Similarly, services companies are adding products to provide differentiation.
- The key impact on the processing markets comes from the entry of new competitors, such as AMR, with "tied" or semi-captive markets. They can "block" market entry and also be targets for a computer/communications utility.

## "Blurring" of Offerings Reflects *Changing Market Structure*

- Systems Integration Continues to Emerge
- Interorganization Services Becoming Critical
- Computer Companies Emphasizing Communications
- Communications Companies Adding Computer Units

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### NOTES:

- "Systems Integration," forecast 5 years ago by INPUT to be one of the major 1990s markets, continues to emerge. "Integration" of data, technology, and applications becoming a major buyer requirement.
- An extension of "integration" is interfacing among organizations' systems; Electronic Data Interchange (EDI), ordering, EFTS, payment systems, credit, logistics, design, and other inter-organizational activities, are going electronic.
- In the market environment, however, computer and communications companies are moving from targeting "product" moves in the other area to "service" moves. Thus, IBM backing away from ROLM but emphasizing network services: AT&T taking one last fling at computers themselves but emphasizing services.
- Thus, both blocks of vendors are moving to satisfy the integration and interface needs. This will include network operations.

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## Consolidation in the Industry

### A Dominant Industry Phenomenon in the 1990s:

- A Smaller Number of Larger Vendors
- Providing a Broader Range of Integrated Offerings
- Supported by Smaller Niche Vendors
- Targeted at Providing Solutions

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#### NOTES:

- It has proved expensive and difficult to achieve critical mass in the industry. To be a major player, \$1 billion in annual revenues is now the yardstick.
- Companies in the middle are the most pressed -- lacking resources to stay in the development game.
- Thus, acquisitions will increasingly occur to foster consolidation. Note that McDonnell Douglas/CDC type acquisitions are not consolidative -- they become conglomerates. FFMC/Computer Associates are role models of consolidation.
- Consolidated vendors will attack solutions operations markets, even software product vendors as we will show later.

# Internationalization

- U.S. Computer Manufacturers Ahead Now
- U.S. Information Services Companies Falling Behind
- Competition Coming to U.S.:
  - Cap Gemini
  - Sema - Cap
  - SDL Seicon
- Japanese Vendor Interest

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## NOTES:

- IBM has responded early and fast to the market demand for globalized services (see Buyer Issues). It is integrating its product and service offerings internationally.
- GEIS is the only other major U.S. vendor that has aggressively attacked the international market for a long time. EDS, of course, has attacked it recently in a very aggressive manner using its GM base as a springboard.
- European and increasingly Japanese companies have a strong international instinct.
- The reason this is important is that one of the major opportunities for "computer utility" services lies in the multinational arena. Note that IBM's Service Link Center in Boulder, Colorado supports 24 U.S. data centers and 24 others worldwide.

# Standards

*Driven by:*

- Internationalization
- Buyer's Integration Requirements
- Dominant Providers/Coalitions

*Focused on:*

- Bridging the Technical Interface
- Rationalizing the Human Interface

**HUMATICS™**

**INPUT**

## **NOTES:**

- Three types of standards exist to address:
  1. Technology interface.
  2. Human interface.
  3. Business interface.
- Users are primarily concerned with 2 and 3, vendors with 1. That is where the vendor coalitions are battling it out.
- Standards affect the operations environment in that they will drive down the cost of the first layer of "value-added," the technology integration for computers and communications. Thus, "utility" services will be under continual price pressure for basic transport/processing services.

# Standards Are Evolving

## Long-Range Implications

- More Comprehensive Global Networks of Diverse Computers
- Graphics-Based User Interface
- Fewer Hardware Manufacturers

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### NOTES:

- Global ISDNs will emerge in the 1990s.
- User interfaces will become standardized.
- Medium-small hardware (and systems software) companies will be pushed to the wall as defensible niches will crumble.
- If software becomes truly portable, then operations cycles and transportation will become truly commodity priced.
- Operations "value-added" will have to include substantial benefits to retain price levels.

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# Vendor Reactions

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## NOTES:

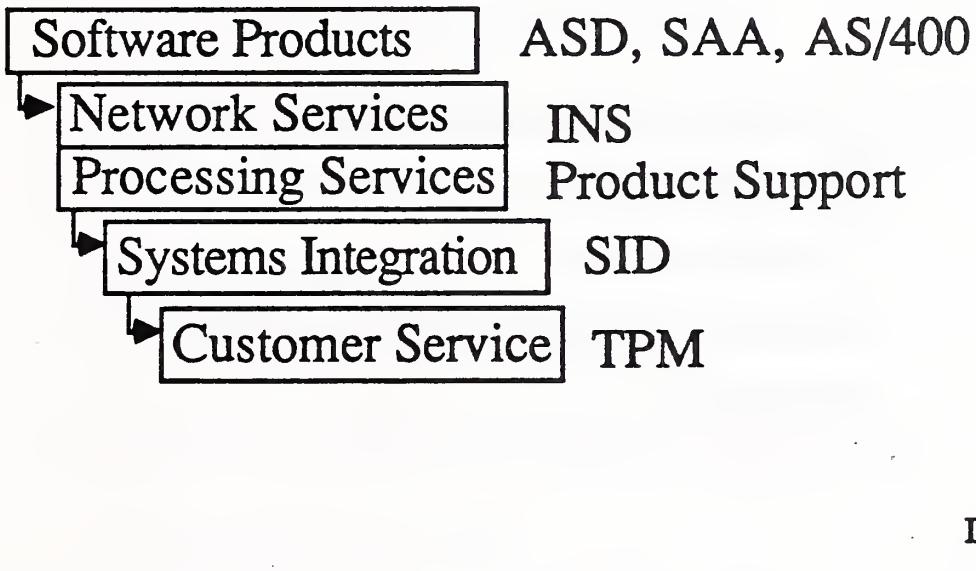
- Let's look at individual vendor reactions to these trends and to other issues addressed later.

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INP

# IBM as an Example



## NOTES:

- IBM has consistently expanded its software and services business over the past 5 years. It is using "standards," such as SAA, to cement its position in the software world. Application Systems Division is both developing and "private labelling" applications software, as well as distributing third-party software.
- Processing services (RCS) is declining in importance in INS, while network activities, particularly EDI, is expanding rapidly.
- Systems Integration Division is aggressively attacking CSI while continuing its federal government tradition. It is a heavy user of business partnerships.
- Perhaps the most innovative services are coming from the "old" customer services division -- an area INPUT has been examining carefully through its Customer Service Program.

# IBM National Services Division

- Will provide systems operations for customers
- 30,000 people
- Works with IBM's SID and INS operations
- *KODAK*

INPUT

## Notes:

- For the first time in 30 years in the U.S., IBM has stated it will provide data center operations for customers. These services are based on the major Service Link Center in Boulder, Colorado. Initially these are remote, "lights-out" (i.e., no people) data center operations. Applications initiation, etc., are still customer responsibilities.
- This division works with SID to support its SI activities and with INS.
- *IBM will not offer "Facilities Management" per se.*

# IBM National Services Division

- Provides all "operations support" functions
  - Data center design and building
  - Remote, "Lights-out" data center operations
  - Hardware/software/network maintenance
  - Disaster recovery
  - End-user software support
  - Systems operations studies
  - Conversion services

INPUT

## Notes:

- IBM provides a spectrum of operations support services. It perceives the potential market to be \$100 billion of which \$40 billion is currently for outside services (primarily hardware maintenance).
- Several of the services are offered with Business Partners (e.g., construction and engineering with Bechtel).
- By aggressively pricing these "operations support" services and including third-party products, IBM will have a major impact on the operations market.

# IBM

- Fundamental changes
  - 1. Sales incentives for services
  - 2. Willingness to provide systems operations services

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## Notes:

- These are fundamental changes that IBM is making.
- They are putting their money where their mouth is! By changing the compensation plan of the sales staff, they are providing heavy incentives for service/solutions selling. This is perhaps the most important activity in the industry today.
- They are rumored to have 8 times as many SI leads as this time last year because of the change in compensation.
- The willingness to provide systems operations services, including disaster recovery and network operations, is also revolutionary.

May 10, 1989

## BUILDING VALUE THROUGH IBM SERVICE

W  
David E. McDonnell  
IBM Vice President and President  
National Service Division  
U.S. Marketing and Services

- McDonnell said that operations and operations support accounts for 38% of the IS budget worldwide or about \$100 billion.
  - Of this, 60% is spent internally and 40% is bought.
  - It is growing 10% per year, with the external portion growing at 13% plus. ?
- IBM will attack this market through NSD which has 30,000 people.
- They have been solving 1 million problems/month over the last 10 years.
- Have 14 years experience of software maintenance with 2,500 people attacking software problems.
- Two years ago they were losing customers, prices were high, quality was low. Redeployed 2,000 people back to the field, reduced prices, and got quality up.
- Was an extension of manufacturing. Re-evaluated that:
  - Now maintain third-party systems.
  - 18 month packaging concept.
  - Purchased Spectrum Solutions to use their network problem determination skills.
  - Provides disaster recovery (slow growing).
- Will provide software problem solving using KBS tools.
- Will turn technology over to the customer, then the customer and IBM will address problem management together. Customer with PS/2 Model 80 can link to IBM support structure through Service Director Service.

- Now have 300 people as branch software support people.
- Willing to operate data centers. Have major center in Boulder, Colorado (Service Link). Would work with SID.
- They will install "lights out" operations and monitor remotely.
- Have 40,000 square feet command center: using 1/4 of capacity now to support 24 centers in the U.S. and another 24 around the world.
- Will do extensive studies using BP methodology.
- Moving to operations support. They have a Vice President of Operations Support.
  - Will do fixed price, multi-year contracts.
- Have made \$2 billion investment in NSD.
- In 1989 they are growing again.
- Key question for companies is their end-user service capability. It costs \$2K-\$4K/year/end-user to provide support. NSD will help "manage-down" this cost.
- Using the Tampa facility, they can achieve 85% reduction in cost versus in-house. Managing 100,000 calls/month using KBS.

## COMPANY PROFILE

**IBM INFORMATION NETWORK (INS)**

3405 W. Buffalo Avenue  
Tampa, FL 33630

**The Company**

The IBM Information Network is concentrating on three specific business areas: EDI, E-Mail, and interorganizational services (IOS). These have been growing rapidly, more than making up for a declining remote processing services base. IBM is bullish on future growth at INS, looking for 80% growth in 1989.

Network  
INSATION

INS is investing in future technologies, evaluating ISDN, image processing, and FAX interface to their network.

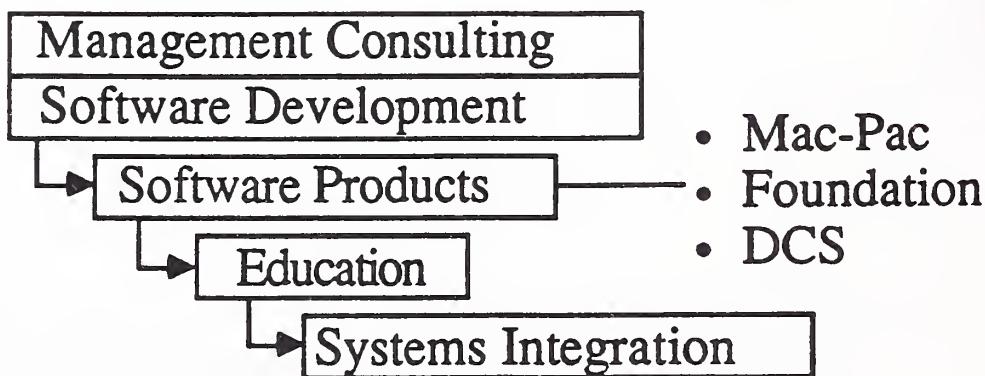
A key strategy at INS is to provide its clients with a single network interface, rather than many. As a part of this service, for example, INS provides a standard link to all appropriate IBM information data bases for its customers.

In January 1988, INS offered the "Quantum Leap" program to 1,000 of its largest clients; INS effectively interconnects all client systems through its own computers and networks, acting as an "enabler" for clients' inter-company transactions and messages, and also as a disaster recovery channel.

- INS currently has 500 field people in the U.S. market, with a ratio of 1.5:1 support to sales.
- INS currently has about \$140 million in U.S. revenues (INPUT estimate, 1988) and 1,200 employees.

NFC

# Andersen Consulting



*WW* \$1.5 Billion *~Fy 88-89*

14,000 Professionals

INPUT

## NOTES:

- Andersen Consulting has the potential to emerge as one of the top 3 computer companies in the world in the 1990s. INPUT has put together a scenario for a \$20 billion company.
- It is providing systems operations now to systems integration clients. Clients own the system.
- It is developing its own network/computer complex to support systems operations and provide processing services.
- In the operations area it will provide a spectrum of services including using its own software and operations complex to provide customer solutions.
- It is moving from a purely development to a development/operations mix.

ARTHUR ANDERSEN & COMPANY  
PROFESSIONAL SERVICES MISSION

*DPC!*

Arthur Andersen & Company is enjoying a phenomenally rapid growth in its Management Information Consulting (MIC) practice. It now has an annual revenue "run rate" of \$1.4 billion in information related professional services. Billable hours in the U.S. for its first quarter of fiscal year 1988 (ending November 31, 1987) were up 27% and this rate has continued through the second quarter. Growth outside of the U.S. is even higher in billings, in the 35% - 45% range. AA & Co. is establishing itself as the leader in empowering organizations to effectively apply technology to their business advantage.

AA & Co. emphasizes intake of high-performing graduates directly from college. Many come from top colleges and graduate schools such as Harvard, the University of Chicago, and Stanford. About one-half of the intake has a technical degree in engineering or computer science. These new hires are put through an intensive training program and then given continued formal and on-the-job training. AA & Co. estimates it spends over \$6,000 per year per person on education and training. This is actual cost not including lost opportunity cost. This training, along with their methodologies and tools, ensures consistent quality across projects throughout the world.

The general attitude of AA & Co. staff is very positive and aggressive. They are committed to on-time delivery of solutions to satisfy client needs. They are a bunch of hungry, bright people. An anecdote illustrates this.

In February, on a cold, snowy Chicago evening, over 200 of their Chicago-based consultants voluntarily attended a meeting on their new CASE tool, FOUNDATION. The two hour meeting included presentations by AA & Co.'s technical, client service, and software marketing personnel on AA & Co. products and strategy in marketing a complete and integrated set of CASE tools. These meetings are held monthly and are very well attended. The Chicago office is their largest MIC office with over 1,000 consultants.

AA & Co. has 226 offices in 49 countries, with 81 in the U.S.

In terms of human resources, their biggest concern is that they did not hire enough people last year. Their total number of MIC professionals is over 13,000.

Industry Market emphasis for AA & Co. in the U.S. is as follows: Manufacturing, Telecommunications, Financial Services, State and Local Government, and the Federal Government. To this point they have been relatively weak in the Federal Government but are moving to strengthen their position. These industries have been chosen because of their attractiveness based on their size, technology employed, market image, available alliances, AA & Co.'s current position, and (for government) counter-cyclical economics.

For top companies in these and other key industries, full-time marketing teams have been established to penetrate the accounts and build long term relationships. The account teams are targeting mission critical opportunities with high information content, high quality requirements, and tight implementation schedules.

AA & Co.'s strategic services are a key vehicle for establishing early, high level entre into the target company. It supports AA & Co. in establishing business process change as a key value for buyers of Systems Integration.

A key feature of AA & Co. is its organization. Unlike other accounting firms, the consulting division has its own organization separate from the audit and tax structure. Thus, each of the AA & Co. offices has a managing partner in charge of MIC who reports through a regional organization to a country managing partner. This organization was put into place last year and has three major benefits for AA & Co.

1. It reduces the audit/tax and MIC potential for conflict by giving the MIC group freedom from an operational and marketing perspective.
2. It increases the size of the resource pools that can be tapped for client projects.
3. It puts the organization into a structure that can easily be "spun-off" if the SEC or Congress so demands, or if AA & Co. chooses to do so. There is no current evidence that such a move is planned by AA & Co.

AA & Co. operates five Advanced Systems Centers which are large IBM computer facilities staffed with technical experts and project managers. Project teams use workstations connected to these centers for the automation of the application development process for each client. Thus, at least part of the development is done on AA & Co.'s computers, not the client's.

Associated with the Advanced Systems Centers are Advanced Technology Centers. These centers specialize in industry and function specific technology. Each has a working demonstration of the technology, e.g., a factory floor (at INFOMART in Dallas) or Engineering Design Department (London). The Technology Centers act as sites for AA & Co. R&D and training, and client Systems Integration projects and education. Additional Technology Centers are planned for the capital markets, insurance, and health care industries.

The Advanced Systems Centers, Advanced Technology Centers, and other software development sites will be linked together by a global voice and data communications network. The network management center will also serve as a client demonstration site.

Another organizational feature of AA & Co. is its strong staff function. A central Technical Services Organization (TSO) has about 500 people charged with keeping the worldwide organization at the forefront of information technology. Included within this unit are the development, maintenance, and support staff for the software products that AA & Co. sells. Product marketing directors are located in the major offices for client promotion and education in our software products. These software products include:

- MAC-PAC
- DCS
- FOUNDATION

The MAC-PAC software products provide manufacturing systems on IBM System/370 and System/38 computers. MAC-PAC/J.I.T. has been added which supports real-time communication with a CIM network. MAC-PAC has been particularly targeted for installation at defense contractors. It also supports both materials requirements planning and just-in-time techniques in an integrated environment.

DCS (Distribution Control System) gives comprehensive coverage of the distribution business cycle: order entry, billing, inventory control, warehouse management, outbound logistics, distribution requirements planning, purchasing, accounts receivable, and marketing information. It is the most widely installed mainframe product in the world. Its systems architecture provides it with significant flexibility through a customization facility and the capability for real-time integration of other hardware and software.

FOUNDATION is an integrated, automated software development environment designed to support the entire life cycle of application software development. Three software packages are included: Method/1, Design/1, and Install/1. Method/1 is a PC-based automated methodology with a fully integrated set of project management tools. Design/1 is a PC-based set of design tools including data flow diagrammers, prototyping capability, and screen and report painters, all using a LAN-based design repository. Install/1 is a mainframe-based code generator including test data management facilities and a fully extensible production data repository for DB2.

Other field functions coordinated by TSO are artificial intelligence and telecommunications centers of expertise. These are central "pools" which are used to support particular client projects.

TSO also operates a software intelligence group which has the following responsibilities:

- Gathering, evaluating, and disseminating comprehensive and up-to-date information on application software products and vendors.
- Working closely with software vendors to enhance their existing products by providing improved features and functions benefitting our clients.
- Informing firm personnel of new application software products, enhancements to existing products, and software industry trends.
- Monitoring software vendors and their products to alert firm personnel to major problems that can develop when implementing and using specific application software packages.
- Helping clients benefit from the most current knowledge and most recent "hands-on" experiences of professional personnel who have worked with and have an in-depth understanding of the capabilities of packaged software products.
- Supporting information professionals on client engagements by providing application software advice and technical assistance.
- Developing methodologies and tools to help ensure successful implementation of application software-based systems.

This software intelligence group has implemented a number of relationships with software products companies through the OASIS program. This program provides AA & Co. with in-depth knowledge of the products of key software companies such as MSA, SAP, and McCormack & Dodge. AA & Co. works on major projects implementing these software products.

Industry specialization, however, is not provided as a centralized staff function. AA & Co. partners and managers in the field with particular expertise and knowledge are assigned responsibility for developing and maintaining the firm's competence in particular industries. They are responsible for communicating new ideas and developments in each industry to all appropriate members of the organization. They plan and conduct seminars and serve as the primary sources for the development of ongoing industry training programs. For example, a partner in their Atlanta, Georgia office has worldwide responsibility for building their practice in the telecommunications industry. He works with a core group of telecommunications industry partners from offices around the world. Each core group partner sells work in the industry and maintains a local base of employees knowledgeable in the industry.

These are also functional specialization groups concentrating in major business functions. Again, these groups are formed of line partners. Each core group identifies emerging business needs in its specialization and facilitates the development and delivery of services meeting those needs. Advice and information for promotions and engagements are provided to other firm staff as needed. Engineering is an example. It is headed by a Dallas partner who reports to the New York partner with overall responsibility for all of Operation Management. He is assisted by functional coordinators specializing in areas such as CAD/CAM/CAE, hardware integration, configuration management, engineering productivity, and automated mapping/facilities management.

The geographical organization is overlaid with the industry, functional, and software specialists. The overlay organizations are embedded in the field organization. This concept is a very strong and unique one. It ensures there is real-world contact by the specialist areas.

One particular strength being built is the support of Systems Integration, particularly in manufacturing. In just two years AA & Co. has established itself as the premier CIM and manufacturing Systems Integration company primarily through a bold and innovative marketing plan, highlighted by the IMPACT exhibit.

In 1986, the IMPACT exhibit first made its appearance at the AMS show in Chicago. It was a fully integrated mini-factory occupying about 12,000 square feet and including equipment from about ten manufacturers. In 1987 it had expanded to 24,000 square feet with fifteen leading suppliers: it included over \$18 million of hardware and software from IBM, Allen-Bradley, INTEL, Intergraph, and others.

The power of the exhibit was that executives from manufacturers can actually see CIM in action. The first year alone generated \$7 million of orders for AA & Co. - over 100 of the chief executives from the top FORTUNE companies visited the exhibit in the first year.

The exhibit, expanded and with new technology, forms the core of one of AA & Co.'s Advanced Technology Centers. It has now been permanently sited at Northwestern University in Evanston, Illinois. The Center is part of the Basic Industry Research Laboratory and is actively connected to the research efforts of the University.

This is part of an aggressive promotional move by the firm. AA & Co. considers that the 1990's will bring a period of rapid consolidation in the industry and that it must get a critical position in order to be one of the surviving key players. As a result they are investing in an overall marketing program including public relations, seminars, and other promotional activities.

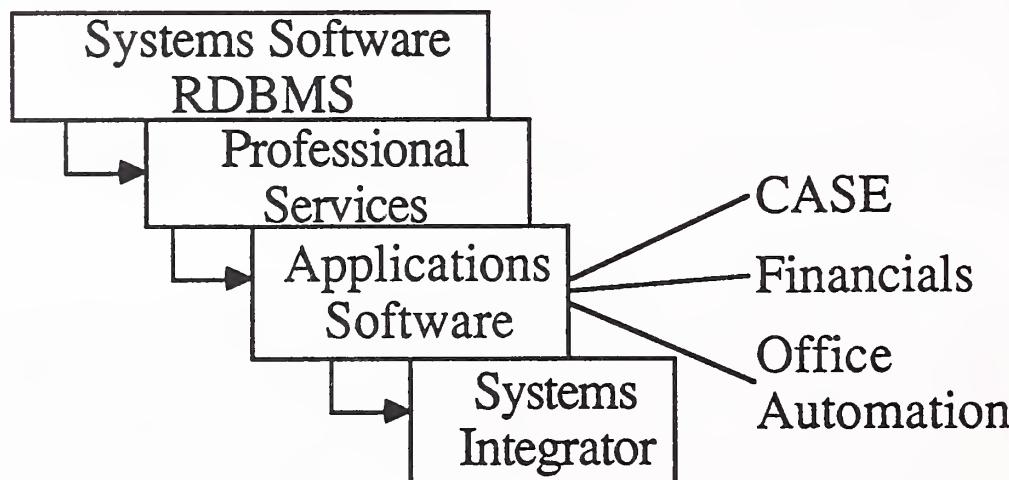
A major thrust in their promotion is to position the firm as the premier commercial systems integrator. They believe they have the objectivity and skills to be a unique provider of these services. They cite four reasons for being in it:

1. Synergy - their existing engagements lead them into it.
2. Culture - AA & Co. has a delivery orientation.
3. Resources - their size and staff capabilities allow them to perform, plus they have the project management disciplines necessary.
4. Demand - their customers are asking for it.

AA & Co.'s other major service lines, strategic services and education consulting directed to change management, complement and support the central Systems Integration thrust. Each service line has dedicated sales personnel and resource pools. Strategic services assists clients to gain competitive advantage through technology and other means. Change management makes the organization and work group changes to ensure successful absorption of the new technology by the company.

In summary, AA & Co. has a vision of where it wants to go and is building the organization, tools, and methods to make it happen. Its strong field operation is supported by an effective staff and excellent education and training facilities. Its growth rate should continue at a 25% to 30% rate for at least the next five years.

# Oracle



INPUT

## NOTES:

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- ORACLE is one of the fastest growing computer companies in the world. It should hit the \$750 million level this year. It could, however, be a "shooting star."
- It will not provide FM immediately. But it could well add its future applications products to operations capabilities.
- Having acquired Falcon Systems, it will emphasize government SI initially. This will be followed by commercial SI and then systems operations.
- By that time it could well be a \$1.5 - \$2 billion a year company.

# Aerospace Subsidiaries

- Tried the "Computer Utility" route
- Have enjoyed limited success
- Successes
  - 1. Government
    - BCS
    - Gruman
    - MMDS
  - 2. Specialized areas
    - TRW
    - McDD-ISG

INPUT

## Notes:

- These companies were the first to try to leverage their large computer facilities into computer services markets.
- They have been largely unsuccessful in commercial markets except through acquisitions:
  - Marketing and flexibility have been problems.
- Martin Marietta Data Systems has virtually disappeared as a commercial vendor. It recently closed its CSI activity.
- BOEING COMPUTER SERVICES has had great success in the federal government and reasonable success in the state and local government areas. It is focussing on SI/SO markets in these segments and in utilities/telecommunications areas.
- TRW has been very successful in Electronic Information Services in the credit and real estate markets.
- McDonnell-Douglas ISG has had great success in network based financial services although many other services have not been successful, including its "utility" services.

# Boeing Computer Services

- Systems Integration Emphasis
  - Federal government
  - State & local government
  - Universities
  - Utilities
- Processing Services
  - Supercomputer services
  - Declining non-federal "utility" services

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## Notes:

- Boeing Computer Services has been successful with systems projects primarily based on its telecommunications capability. It also has a specialty in the supercomputer operations and network area.
- BCS has had some success in discrete manufacturing based on MAPTOP. Also, special systems for surface transportation.
- State and local, as well as federal government markets, have been successful targets for BCS; its non-government markets are quasi-governmental.
- It is a technically oriented services company. Its operations services are successful only in its target markets, primarily in support.

# Aerospace Companies

- Litton Computer Services
- Provides "computer utility" processing services
  - \$30M revenues
  - "Packaged" pricing
  - Emphasis in Los Angeles

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## Notes:

- One company that has had some success with its "computer utility" has been Litton Computer Services.
- It purchases the largest, latest IBM computers, puts up all the latest operating systems/data base management systems, etc., and then packages a utility service at fixed price levels.
- This has grown nicely and profitably. It is really attacking those companies that do not want their own data center and the people associated with it.

## Vendor Activity

### McDonnell Douglas ISG

- Reorganization Continues
- Lost \$42 M in 1987
- Lost \$4 M in 1988
- Systems Integration Strategy
- Medical Division Sold to Systematics
- Sound Basic Business

• *SOLD PYMTS TO BTI*

INPUT

*SYSTEMS ASSOC (DIROR EXP)*

#### NOTES:

- Some additional words on ISG. It has sold its FM businesses in hospitals to ~~Systematics~~. It had stagnated over the years. ~~Systematics~~ now has a powerful base in the two key FM markets: ~~banking and hospitals~~.
- ISG is moving to rationalize its business, and with an SI/SO strategy in limited areas, may well be successful again.
- Its VAN services are succeeding at the higher levels.
- Several units, such as manufacturing, may be terminal.

COMPANY PROFILE

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**McDONNELL DOUGLAS  
INFORMATION SYSTEMS  
COMPANY**  
P.O. Box 516  
St. Louis, MO 63166  
(314) 232-0232

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**The Company**

McDonnell Douglas Information Systems Company (formerly McDonnell Douglas Information Systems Group) offers remote computing/network services, software products, professional services, and turnkey systems to over 250,000 government and commercial clients worldwide. The company also manufactures and markets minicomputers and provides maintenance services.

- McDonnell Douglas Information Systems Group was created in April 1984 with the consolidation of three of McDonnell Douglas Corporation's divisions (McDonnell Douglas Automation Company, Microdata Corporation, and Vitek Systems, Inc.) with the newly acquired Tymshare, Inc.
- Since 1985, the group has undergone several reorganizations and has divested certain businesses. The current organization, renamed McDonnell Douglas Information Systems Company in early 1988, offers industry-specific solutions to the federal government and the manufacturing, health-care, insurance, retail, and telecommunications industries, as well as cross-industry products and services, including application development tools; consulting, education, and systems development professional services; remote computing (utility processing) services; and network applications services for electronic mail and electronic data interchange (EDI).

88=??

Information Systems Company revenue for 1987 reached \$1,242 million, a 4% increase over 1986 revenue of \$1,190 million. Operating losses were \$42.3 million, compared to losses of \$69.7 million in 1986.

McDonnell Douglas management attributes Information Services Company's losses to the following:

- 1987 earnings were adversely affected by \$36 million in write-offs of investments in businesses no longer considered strategic.

- Sales in several product lines were lower than anticipated, and an unexpectedly high percentage of total revenue came from sales of relatively low margin products and services.
- Losses in 1987 and 1986 also include charges of \$53.2 million and \$87.9 million, respectively, related to the amortization of acquisition costs.
- Losses in 1987 were partially offset by a \$44.3 million gain from the sale of several investments, including partial ownership in a health maintenance organization and a French computer services firm.
- Corrective action begun in the fourth quarter included a reduction of approximately 4% in the information services work force, elimination of some product lines, and selective reorganization of some businesses.

Information Systems Company's primary competitors, by business area, include the following:

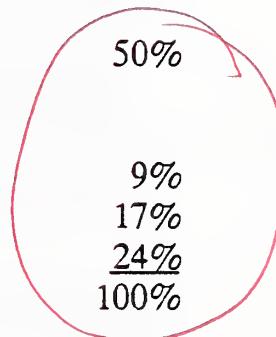
- Health services competitors include HBO & Company, Shared Medical Systems, and TDS Health Care Systems.
- Federal government professional services competitors include Computer Sciences Corporation, Electronic Data Systems, Boeing Computer Services, and Martin Marietta Data Systems.
- UNIGRAPHICS competitors include IBM, Calma (General Electric), Intergraph, Applicon (Schlumberger), and Prime.
- Value-added network competitors fall into two categories, as follows:
  - Other value-added network providers: Telenet, CompuServe, Computer Sciences Corporation, GE Information Services, and IBM Information Network
  - Other packet-switch equipment vendors (private networks): Bolt Beranek and Newman, Telenet, and Northern Telecom
- Diversified services competitors, by product/service area include the following:
  - Telephone industry: Boeing Computer Services, GE Information Services, Electronic Data Systems, and Cincinnati Bell

- Insurance industry: Electronic Data Systems and Policy Management Systems Corporation
- TeleCheck: Telecredit
- Credit card authorizations: National Data Corporation
- Electronic data interchange: Sterling Software, Inc. (ORDERNET) and GE Information Services

### **Key Products and Services**

Approximately 85% (\$1,056 million) of Information Systems Company's 1987 revenue was derived from information services and 15% (\$185 million) was derived from computer sales and service. A further breakdown of information services revenue follows:

Processing services  
 - Remote computing (27%)  
 - Network services (23%)  
 Software products  
 Professional services  
 Turnkey systems



The Health Systems Company contributed an estimated \$246 million to 1987 revenue, a 2% decrease from 1986 revenue of \$250 million. Approximately 60% of revenue is derived from turnkey systems and 40% from processing services. The company claims that one out of every four hospitals in the U.S. uses one or more of its systems.

McDonnell Douglas Network Systems Company sells public data network communications services and private data network systems. This unit contributed about \$187 million to 1987 revenue, a 13% increase over \$165 million in 1986.

- TYMNET is McDonnell Douglas' public packet data communications network. Based on intelligent communications processors connected by a network of leased telephone lines, microwave links, and satellite channels, TYMNET provides users with low-cost access to host computer applications from terminals and microcomputers worldwide. TYMNET provides value-added services such as error protection, protocol conversion, and data security.

McDonnell Douglas Diversified Information Systems Company contributed approximately \$250 million to 1987 revenue, compared to 1986 revenue of \$276 million.

- The Integrated Business Systems Division provides software products, remote computing services, and professional services primarily to the communications, insurance, and manufacturing industries. Cross-industry products and services are also provided.

Manufacturing applications are available for time and attendance, work order tracking, labor reporting, shop floor graphics, distributed numerical control with linkages to material requirements planning, plant maintenance, and distribution.

- GDS is CAD/CAE software that supports architectural design and drafting, civil engineering, structural engineering, and mapping applications. The product line contributed about \$25 million to 1987 revenue, compared to \$30 million in 1986.
- Other manufacturing software products contributed revenue of \$16 million in 1987, compared to \$21 million in 1986.

Credit card and check authorization services contributed an estimated \$85 million to 1987 revenue, up 20% from \$71 million in 1986.

- Credit card authorization services are available 24 hours a day, seven days a week via local call access to TYMNET.

EDI services contributed an estimated \$7 million to Information Systems Company's 1987 revenue. The principal EDI service, EDI\*Net<sup>R</sup>, was formally introduced in 1983, although the company has provided logistics data interchange services since 1981. EDI\*Net supports mailbox and outdial services, using TDCC, X12, International GTDI, and UCS standards.

**Industry Markets**

Information Services Company derives its revenue primarily from the health-care, manufacturing, retail, and telecommunications industries. 1987 revenue was derived approximately as follows:

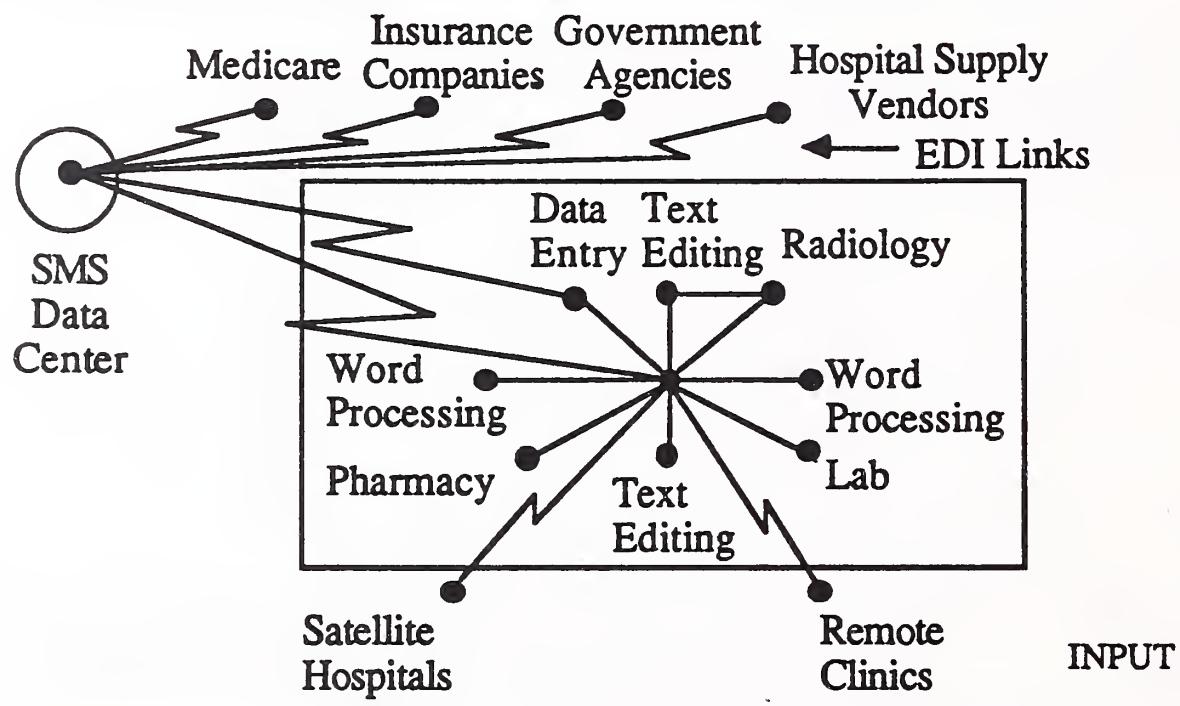
Health care	23%
Manufacturing	16%
Retail	10%
Telephone	6%
Insurance	2%
Architecture, engineering, and construction	2%
Distribution	2%
Federal government	2%
Other government	2%
Cross-industry	<u>35%</u>
	100%

**Geographic Markets**

Approximately 75% of Information Systems Company's 1987 revenue was derived from the U.S. and 25% was derived from international sources.

The company maintains approximately 600 offices worldwide.

## Shared Medical Extended Network



### NOTES:

- Example of another value-added processing services company that has stagnated over the last few years at about \$400 million.
- Only offers limited level of service (a very high level it must be added).
- Emphasis is on restructuring.

# Computer Science Corp/Infonet

- Infonet is now separate company
  - Focused on network services
  - Provides "enhanced network management" services
  - Also provides processing services
- Infonet ownership is distributed:
  - Minority CSC ownership
  - International PTTs major investors

INPUT

## Notes:

- INFONET has "spun-off" from CSC and formed into an independent company with ownership distributed among PTTs from Germany, France, Spain, Australia, etc.
- It is selling its network management expertise and establishing a linked series of partnerships that will be very powerful in multinational markets.

## COMPANY PROFILE

### COMPUTER SCIENCES CORPORATION

2100 East Grand Avenue  
El Segundo, CA 90245  
(213) 615-0311

#### The Company

Computer Sciences Corporation (CSC), founded in 1959, is the largest independent professional services company in the industry. Serving government and commercial clients, CSC provides requirements analysis, software development, systems engineering and integration, communications, systems engineering, turnkey computer-communications systems, and facilities management services. The company also provides industry-specific proprietary products and services for credit reporting, claims processing, health maintenance organizations, income tax preparation, and manufacturing and distribution applications. It also provides value-added communications and remote computing services via INFONET, CSC's international data communications network.

CSC's management objectives are to continue to maintain strong revenue growth and a leading position in the federal government marketplace (which contributed two-thirds of CSC's fiscal 1987 revenue), while increasing the percent contribution of revenue from its non-federal markets through both internal growth and acquisitions. The company plans to invest over \$200 million in acquisitions by fiscal 1991, primarily in professional services and the fields of consumer finance, health care, and insurance. The company is also giving major attention to the emerging commercial and international markets for systems integration services, drawing on its experience in large federal systems integration programs.

CSC provides its products and services through the following operating groups:

- Federal Systems and Services, represented by the operations of CSC's Systems Group (headquartered in Falls Church, VA), is the company's primary provider of technical services to the federal government. Services provided include system engineering and integration, the development of custom-designed computer-based systems and communications systems, operational support of clients' technical activities, clients' computer facilities management, and turnkey system development.

- The Systems Division, headquartered in Falls Church (VA), primarily designs and builds systems for office information, digital documentation, and administrative support.
- The System Sciences Division, headquartered in Silver Spring (MD), provides systems engineering, analysis, software development, and end-to-end integrated data systems and services primarily to aerospace clients such as NASA and the FAA.
- The Network Systems Division, headquartered in Falls Church (VA), designs and builds communications networks and real-time telemetry systems for military and civil agencies of the government.
- The Special Projects Division, headquartered in Falls Church (VA), performs high-level technical management projects, known as systems engineering and technical assistance (SETA), for the government. The division also performs research and development in systems and software technologies, and special activities in signal processing, communications systems, and information processing.
- The Systems International Division, headquartered in Herndon (VA), markets and supports systems and consulting contracts in the Middle East, Asia, and South America.
- The Applied Technology Division, headquartered in Falls Church (VA), provides facilities management services to aircraft and weapons test centers and provides software development support to federal agencies. This division includes the operations of the former Energy Research Division, which manages a contract with the Department of Energy.
- The Defense Systems Division, headquartered in Moorestown (NJ), designs and develops military systems for weapons control, logistics, wargaming, training, and command and control.
- Health and Insurance Systems provides processing services, turnkey systems, and associated services through two separate business units.
- The Health and Administrative Services Division, headquartered in Sacramento (CA), performs Medicaid facilities management processing for state governments, manages the National Flood Insurance Program for the Federal Emergency Management Agency, and processes black-lung medical claims for the Department of Labor.
- CSC Comtec, Inc., headquartered in Farmington Hills (MI), provides turnkey systems and services to health maintenance organizations, preferred provider organizations, third-party administrators, and traditional indemnity plans.

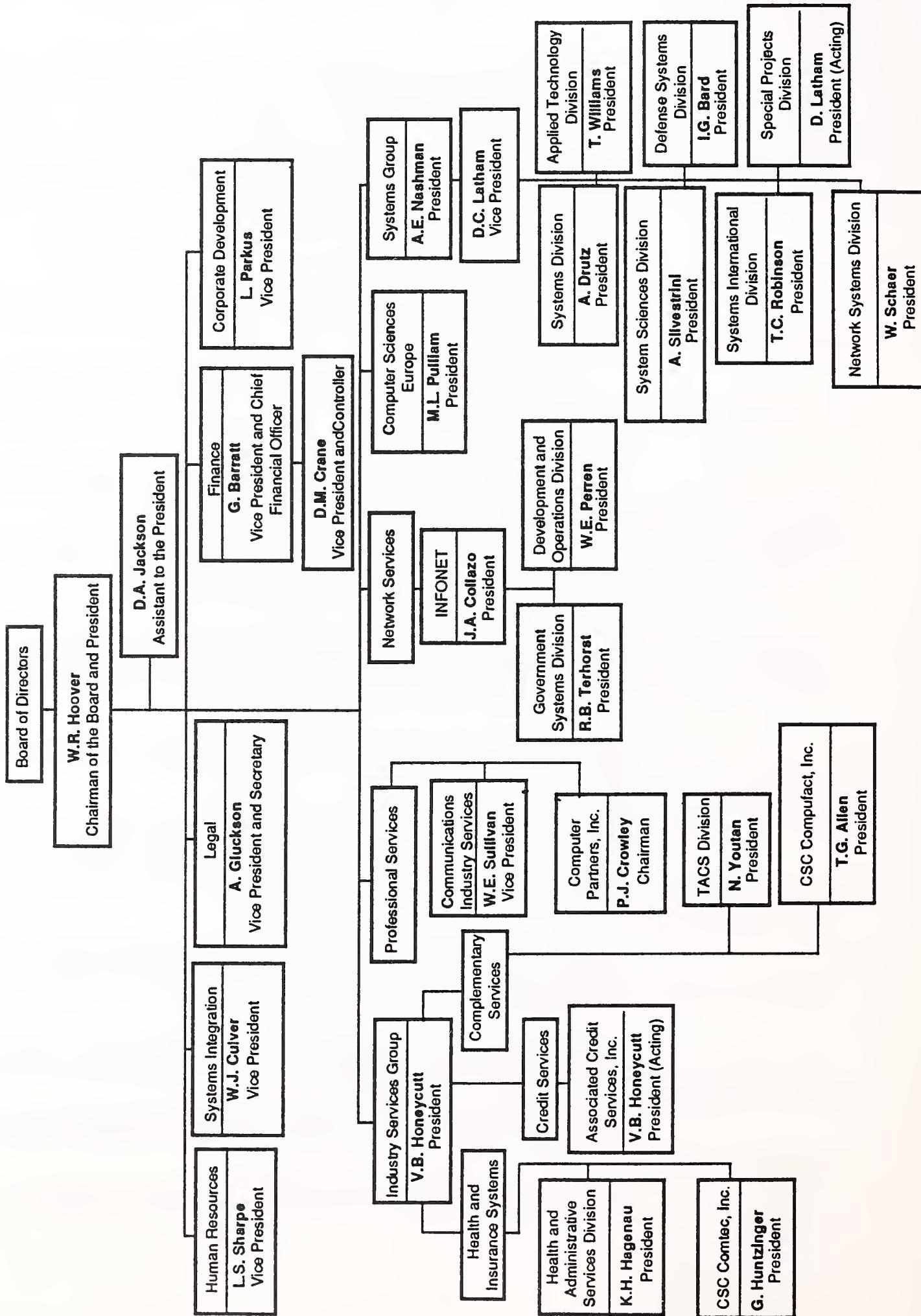
- Professional Services, headquartered in El Segundo (CA), provides requirements analysis, system design, software development, system engineering and integration, communications systems engineering, and facilities management for non-federal organizations in industry and government. Several recent acquisitions have increased CSC revenues and presence in this category of service.
  - Index Systems, a prominent professional services firm based in Cambridge (MA)
  - Computer Partners Inc., a wholly owned subsidiary based in Waltham (MA)
  - Communications Industry Services, based in Piscataway (NJ), which specializing in services to telephone companies
- Computer Sciences Europe, headquartered in Brussels, manages the activities of subsidiaries in Belgium, the Netherlands, Switzerland, the United Kingdom, and West Germany. These units provide commercial professional services as described above, and market and support INFONET data communications services in Europe.
- Credit Services provides consumer credit reporting and collection services to credit grantors and independent credit bureaus through Associated Credit Services, Inc., a wholly owned subsidiary based in Houston (TX).
- Network Services, headquartered in El Segundo (CA), provides value-added network services, enhanced data communications services, and remote computing services on an international basis. Service is focused on international markets for data communications.
  - The INFONET Division, headquartered in El Segundo, markets data communications services to commercial and international clients.
  - The Government Systems Division, headquartered in Arlington (VA), markets remote computing and data communications services to agencies of the federal government.
  - The Development and Operations Division, headquartered in El Segundo, supports R&D application development, data center operations, and maintenance of the network.
- Complementary Services provides industry-specific products and services.

- The TACS Division, based in Los Angeles (CA), processes income tax returns for tax preparers.
- CSC Compufact, Inc., headquartered in Garden Grove (CA), provides turnkey systems, application software, and professional services to manufacturers and distributors.
- CSC's current organization structure is shown in the exhibit.
- In July 1986 CSC acquired Computer Partners Inc. (Waltham, MA). Terms of the cash purchase were not disclosed.
  - Computer Partners provides consulting and systems development professional services to Fortune 1000 corporations and other large users of computers.
  - Computer Partners' annual revenues exceeded \$20 million and the company had 300 employees at the time of the acquisition.
  - Computer Partners now operates as a wholly owned subsidiary of CSC within CSC's Professional Services operations.
- These purchases are part of a \$200 million five-year strategic acquisition program begun in April 1986 to augment CSC's commercial business in credit services, health and insurance systems, professional services, and network services.

Major competitors by primary service/product area include the following:

- Federal government professional services: TRW, Hughes Aircraft, IBM Federal Systems, Planning Research Corporation (PRC), General Electric, AT&T, Unisys (System Development Corporation), and Ford Aerospace & Communications Co.
- Commercial professional services: Arthur Andersen, Electronic Data Systems (EDS), IBM, Martin Marietta, Computer Task Group, and AGS Computers
- Value-added network services: U.S. Sprint (Telenet) and McDonnell Douglas Network Systems (Tymnet)
- Remote computing services (to federal agencies): Boeing Computer Services
- Medicaid claims processing: Blue Cross/Blue Shield and EDS

## CSC ORGANIZATION CHART



- Credit reporting service: TRW Information Services, Equifax, Chilton, and TransUnion
- Health-care systems: Jergovan and Blair, Inc.
- Manufacturing/distribution products: ASK Computer Systems and Triad Systems

## Geographic Markets

CSC maintains offices in principal cities throughout the U.S. Operations in Canada, the United Kingdom, Belgium, Germany, the Netherlands, and Switzerland are through subsidiary companies.

CSC owns minority interest in affiliates in Venezuela, Australia, France, and Sweden.

INFONET services are provided through subsidiaries, affiliates, or representatives in Canada, Argentina, Brazil, Chile, Mexico, Uruguay, Japan, Korea, Hong Kong, Taiwan, Philippines, Singapore, Australia, New Zealand, South Africa, Denmark, Finland, Sweden, Norway, Belgium, West Germany, The Netherlands, Italy, Spain, Switzerland, France, and the United Kingdom.

## Computer Hardware and Software

INFONET provides remote computing services from data centers in El Segundo (CA), Beltsville (MD), and Toronto, Canada. A total of five Unisys 1100/82 systems are installed, operating under CSC's proprietary operating system CSTS II. The Beltsville center also has IBM 3081-KX and 3084-QX systems installed.

- CSC has developed its own communications network, using leased facilities, to provide remote computing services in North America, Australasia, Europe, and the Far East. International record carriers are used in other locations.
- Local access to INFONET is provided throughout the U.S. by CSC's own network (over 150 cities)—INWATS—and gateways to other domestic networks.

Other data centers operated by CSC include:

- Associated Credit Services' data center in Houston uses Amdahl V/8 and 5880 mainframes and DEC VAX 8650 and VAX-11/785 systems.
- Health and Administrative Services Division: An Amdahl 5867 is installed in Sacramento (CA) for Medicaid claims processing.
- Pittsburgh data center: General, hospital, and insurance processing services are offered on IBM computers.
- TACS Division: Magnuson computers are installed in Los Angeles and Bensonville (IL).

# General Electric Information Services

- Original "Computer Utility"
- Emphasized network utility in 1980s
- Static and troubled in mid-1980s
- Now growing through:
  - Value-added network services
  - International services
- Approximately \$450 million - 50% U.S.

INPUT

## Notes:

- GEIS has had substantial problems converting from utility services (timesharing) to value-added, network-based services.
- Its strength internationally has held it up.
- Its pricing methodologies have been archaic in the U.S. Companies like CompuServe have been much more aggressive and successful in GEIS basic business largely because of this.

## COMPANY PROFILE

### GE INFORMATION SERVICES

401 North Washington Street  
Rockville, MD 20850  
(301) 340-4000

#### The Company

GE Information Services (GEIS) was formed in 1979 as General Electric Information Services Company (GEISCO) to consolidate General Electric Company's (GE) MARK III worldwide interactive and remote batch processing services, originally introduced in 1965 under the MARK I name as the first interactive processing service commercially available in the U.S. The organization unified the U.S. operations handled by GE's Information Services Division with European and Australian operations run by Honeywell. Honeywell retained a 16% interest in GEISCO until January 1972, when GE purchased Honeywell's interest for approximately \$70 million.

GEIS currently provides remote computing, inquiry/response, electronic data interchange, and value-added processing and associated support services to over 5,000 clients worldwide, primarily in the manufacturing, banking, telecommunications, international trade, shipping, and retail industries.

INPUT estimates that GEIS's total 1987 revenue was approximately \$400 million. GEIS management confirmed that 1987 revenue increased 2% over 1986 and that 1988 revenue growth will be in the double digits.

- GEIS management has stated that over the period from 1983 to 1987 a number of factors have impacted its internally reported revenues. These factors included a change in the basis of reporting revenues for GE Consulting Services and GE Computer Services, which are now separate operations under CSO, and the divestiture of certain operations, including Software International.
- GEIS also states that over the period from 1983 to 1987 its revenues had been impacted by a de-emphasis in supplying clients with computer hardware and a restructuring of its business, replacing timesharing applications with full applications integration services and other new value-added services.

**Key Products and Services**

INPUT estimates GEIS's 1987 revenue was derived approximately as follows:

Network-based services	85%
Network software services support	5%
Professional services	<u>10%</u>
	100%

GEIS has the MARK III® Service as its processing/network services offering. This service is used by over 5,000 clients.

GEIS services are categorized into the following application areas:

- International Banking and Financial Services
- Worldwide Intercompany and Logistics Businesses, including Implementation Services
- Business Systems Products
- Value-Added Network Services
- Consumer Information Services

The Business Systems Products Unit provides products and services for office automation and communications that link geographically dispersed operations.

GEnie™ (GE Network for Information Exchange) is an electronic consumer information service for microcomputer end users.

**Industry Markets**

GEIS's 1987 revenue was derived approximately as follows:

Banking	40%
Manufacturing	32%
Telecommunications	10%
Transportation	10%
Retail	5%
Other	<u>3%</u>
	100%

GEIS currently has a client base of over 5,000 corporations and trade associations, including nearly 64% of the Fortune 500 companies.

**Geographic Markets**

Approximately 50% of GEIS's 1987 revenue was derived from the U.S. and 50% from international sources.

GEIS products and services are offered through over 60 U.S. offices and offices in 30 countries, with global support and access provided by distributors, affiliates, or private data networks in 40 additional countries.

- U.S. regional offices are located in New York City, Atlanta, Chicago, and San Francisco.
- International offices are located in Australia, Austria, Belgium, Canada, France, Germany, Hong Kong, Ireland, Italy, The Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, and the U.K.

Software Development Centers are located in Rockville (MD), Nashville (TN), Berkeley (CA), and Dublin (Ireland).

GEIS's network provides clients with local dial-up services in 750 cities in more than 30 countries worldwide and is available 24 hours a day, seven days a week, 365 days a year. Coverage is extended to 70 countries by using network gateways to several public data networks.

**Computer Hardware and Software**

The GEIS network uses over 1,000 processing and communications computers. Over 400 of these are Honeywell PMSDs, used to handle communications. Large-scale IBM and Honeywell processors are concentrated in supercenters in Rockville, Cleveland, and Amsterdam. These consist of:

- Thirteen Honeywell DPS 90/ACOS 1000s and seven Honeywell DPS-8/70s operating under GEIS proprietary software for interactive processing, and 15 Honeywell DPS-8/70s running under GCOS for background remote batch processing
- One IBM 3081, one IBM 3090, and one IBM 4341 for interactive and remote batch processing on the MARK 3000 Service

GEIS's teleprocessing network handles over a quarter million user sessions per day, transmitting over 400 million characters of data in and out of the system per hour.

The network consists of satellite links, microwave links, undersea cables, and 350,000 miles of land lines.

## European Companies

- CAP Gemini Sogetti (CAP-SESA) is parent of CAP Gemini America
  - Close to \$1 billion in 1989
  - Focus on professional services
- Aggressive acquirer
- Will not attack operations market directly
  - Provide support services
  - Emphasizes development market

INPUT

### Notes:

- One of the most successful, independent, information services companies in the world is CAP-SESA.
- It concentrates on the applications development market and is an aggressive acquiror worldwide in that area.
- However, it is beginning to add operations support services such as network planning and conversion services.

## European Companies

- Hoskyns:
  - Very successful in FM
  - Good "computer utility" model
  - Avoided industry specialization
- Thorn-EMI
  - Also successful in processing utility
- SD-Scicon, GSI, Sema-Cap, others
- PTTs becoming more aggressive

INPUT

### Notes:

- Hoskyns (part of Plessey) and Thorn-EMI have successful FM businesses in the U.K. Unlike the U.S. FM business, their operations do not include proprietary applications software.
- They are good role models for "computer-utility" operations, somewhat similar to Litton Computer Services.
- Other European companies offer operations services of various kinds, none of great significance. The PTTs, like BRITISH TELECOM, are becoming much more aggressive.

# Japanese Companies

- NT&T Data Services
  - Primary market government
  - SI/Systems operations
- Many VAN companies (500)

INPUT

## Notes:

- There are hundreds of VAN companies in Japan, many of them supporting other companies in their "family."
- NT&T Data Services is the major SI/SO vendor, primarily working on a "semi-captive" basis for government and quasi-government agencies. It will continue its operations/development expansion in Japan and the Pacific Rim.

# Japanese Companies

- Large information services vendors
  - Primary professional services
  - Moving into SI
- Processing/network companies moving to U.S.
  - e.g., JAIS (Sumitomo Group)

INPUT

## Notes:

- There are large Japanese information services companies such as CAC, NBC, Hitachi Software Engineering, etc. They are primarily straight professional services or utility processing companies.
- Many of them are moving into Systems Integration (there are 77 licensed SI vendors in Japan!). They will also move into systems operations as this becomes fashionable!
- Japanese vendors are important to consider on an international basis, however, since they follow Japanese customers around the world. Companies such as JAIS offer systems operations/facilities management services to companies in their group and trading partners.

## **Summary**

- Vendors Entering New Product/Service Areas; Competition Increasing
- Alliances/Mergers Necessary for Growth, Survival for Many Vendors
- International Opportunities
- Vendors Must Recognize Standards Impact

**INPUT**

### **NOTES:**

- Competition in the "computer utility"/systems operations markets will increase because of these trends.
- Many specialized companies will partner with a utility to provide services.
- International opportunities are key, but they also bring international competitors.
- Standards will make "commodity" markets even more price competitive.







### **III. Buyer Issues**

**INPUT**

**Notes:**

# Fundamental Driving Forces

## *Key Business Trends:*

Shorter Product Life Cycles

More Customization/Specialization

Narrower Market Segments

Higher Impact of Technology

More Competition in U.S. from  
Overseas Vendors

INPUT

### NOTES:

- These business trends are putting intense pressure on U.S. businesses to:
  - Move faster.
  - Keep costs down.
  - Be more flexible.
- In this environment the IS organization becomes critical. This is because in virtually every industry, Information Technology and Systems has moved from a supporting to an active, operational role.
- Operations that have been performed by in-house "empires" may well open up to operations services as a result.

## Internationalization

### *A Dominant Trend in the '90s*

- Collapsing Market Barriers
  - Europe
  - North America
- Growing Market Interest/Participation
  - Pacific Rim
- Internationalization of Buyer Requirements

INPUT

#### NOTES:

The number one issue in a recent INPUT survey of CIOs was "globalization."

- For many organizations, country operations have been autonomous -- now they will have to be integrated.
- This provides a major opportunity, in INPUT's opinion, for multinational systems operations (computer/communications utility) services.

# 1992 Single European Market

- Objective - Free Movement
  - Physical
  - Technical
  - Fiscal
- Restructuring
- Key Sectors
  - Vendors Network Services
  - Users Financial Services
- Threat—"Fortress Europe"

INPUT

## NOTES:

- The catalytic factors in the globalization issue are primarily the Japanese threat and the 1992 Single European Market.
- The changes are primarily in peoples' minds. For the first time many companies are thinking internationally from production, operations, distribution, taxation, personnel, and other viewpoints.
- In many areas their systems operations do not support their future goals, particularly the establishment of new business entities.

# Organizational Change

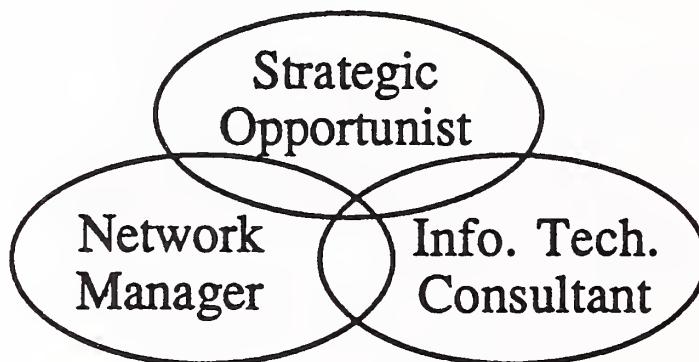
- Key trends affect structures
- Acquisitions/divestitures/LBOs affect structures

INPUT

## Notes:

- The key business trends are changing business structures:
  - Headquarter functions are being distributed to operational units.
  - Units are being streamlined.
  - International units are being established.
  - International operations are being rationalized and linked.
- Financial market activities are changing corporate structures.
- Result is that IS planning and operations need to be much more flexible.
  - IS activities must be distributed.
  - Architecture must be flexible and standardized.

# Information Systems Executive Role in the 1990s



An Internal "Systems Integrator"

INPUT

## NOTES:

- The role of the CIO will change in the 1990s.
- Increasingly it will be the CIO's role to ensure the enterprise and unit IS can respond to changes outside the enterprise.
- They are also likely to have an operational responsibility, sometimes in line-functions, other than IS.
- CIOs will still be responsible for IS problems corporate-wide. Distributed activities are being returned to them today when problems occur.

JJ88-DT2-41

MPRE89-276

INP

## IS Responsibilities—1990s

- Treat "Users" as Customers
- Analyze "Make" or "Buy" Decisions
- Consult on Strategy and Direction
- Support Organizational Units at All Levels in Use of:
  - Information
  - Information Systems and Services
  - Information Technology

INPUT

### NOTES:

- The CIO will operate a service operation which will constantly analyze "make/buy" scenarios. Already INPUT sees CIOs of some large organizations looking at "outsourcing" operations as a fundamental way of doing business.
- CIOs will operate support centers (an area IBM has targeted) for end-users.
- The span of responsibility of the CIO in terms of planning will be increased. Thus, they will need more support.

JJ88-DW1-10A,B

MPRE89-282a,b

INPUT

# IS Organization in the 1990s

Not Centralized

Not Decentralized

Federated

Brought together "by agreement of each party to sublimate its power to the central authority in common affairs." - Webster

INPUT

## NOTES:

- The role model for the IS organization in the 1990s is a Federal model.
- For computer utility/systems operations this is good news since the number of buying points expands dramatically. Although this provides opportunities, it also brings additional marketing costs, INPUT believes.
- "Qualified vendor" lists will become common.

## Major Buyers Issues—1988

- Rising Management Expectations
- User Demands for Increasingly Complex Solutions
- Managing the Technology Investment
- Integration—Data/Applications/Technology
- "Mission Critical" Solutions

INPUT

### NOTES:

- Within IS there are major conflicting pressures. Upper management believes the press, and is expecting more, faster!
- At the same time, organizations are looking to IS to reduce costs of operations and to control its own costs. Few organizations are justifying IS expenditures on "better information". Most are being very hard-headed at the corporate level. Most are allowing unit expenditures as long as they meet their business goals.
- Integration of new applications, data, and technology with old is an increasing problem and cost. Implementation can be more expensive than development.
- An exception to cost pressure constraints are "mission critical" systems that must be addressed regardless, e.g., an airline reservation system.

## Blocking Factors

- Infrastructure Gridlock
- Lack of Qualified In-House Personnel
- Existing Applications Portfolio
- Organizational Response Time

*Create Opportunities for the Information Services Industry*

INPUT

**NOTES:**

Key Information Systems considerations include these blocking factors.

- These blocks cause frustration to build at an executive level.
- In many cases an external force or factor may be needed to achieve change (EDS in GM is a classic example).
- These factors primarily affect development/SI opportunities but have some impact, especially downstream, on SO opportunities.

## Information Systems Priorities—Beyond 1989

- Clear Expectations of IS
- Identify Mission Critical Processes
- Application Development—Use All Alternatives

INPUT

**NOTES:**

- These are the "front-end" objectives of CIOs.

JJ88-DT2-40a

MPRE89-274

INPUT

## Information Systems Priorities—Beyond 1989

- Data Management—Company-Wide Orientation
- Technology Architecture—Network Management
- Central IS—Consulting Role

INPUT

**NOTES:**

- These are the operational, "back-end" objectives of CIOs. The "front-end" consulting role is a "support" role at the "back-end."
- Key to these activities is the establishment and enforcement of standards to avoid chaos.
- Also, the architecture and network structure parameters must be adhered to throughout the organization.
- All IS vendors including "computer utility" will be required to fit these parameters which will vary from enterprise to enterprise.

# Results of Recent CIO Survey

INPUT

Notes:

ZCUT-55

# Industry Structure Model

- Information-oriented
- Service-oriented
- Product-oriented

INPUT

Notes:

## Industry Structure Model

- Information-oriented
- Service-oriented
- Product-oriented

---

"For purposes of this study, we have divided industries into 3 basic categories, based on the nature of their output..."

- Information-oriented: no physical object produced/delivered/modified/maintained
  - banking/finance
  - insurance
  - telecommunications
- Service-oriented: generally involve manipulation of some physical object, although object is of secondary importance
  - wholesale/retail
  - transportation
  - utilities
  - medical
- Product-oriented: physical objects primary
  - discrete manufacturing
  - process manufacturing
- These are "pure" characterizations
  - some organizations are conglomerate mix of several types of divisions
  - some organizations are combination of functions
    - . Macdonalds = product + service
- Two important characteristics of product-oriented firms
  - physical goods orientation
  - manufacturing orientation
- Manufacturing issues have become increasingly important in service and information industries

(this analogy originally popularized by John Reed in early 1970s when he was head of Citibank's Operating Group)

  - process/work flow management
  - need for constant "retooling" (flexible automation)

## Information-Oriented

- Heavy involvement in enterprise planning
- Strong technology strategy
- Mixed systems development roles
- Strong core operations

INPUT

Notes:

## Information-Oriented

- Heavy involvement in enterprise plng
- Strong technology strategy
- Mixed systems development roles
- Strong core operations

---

- Information technology (IT) is key factor in information-oriented firms
  - information is the product/output
  - IT is the basic manufacturing/distribution mechanism
  - there is often an interrelationship between various individual products/services
  - individual products/services may be marketed by multiple BUs to different market segments
- Key role of information means that CIO almost always
  - on executive/managing committee
  - reports to top of organization (CEO/COO/OofC/etc)
  - actively involved in strategic/enterprise plng
- Where CIO reports through another senior officer, it is commonly an EVP of operations with responsibility for all non-legal/regulatory/administrative functions
- Two key elements of information-oriented firm strategy
  - flexibility of systems, allowing rapid creation/modification of products in response to changing market demands
  - finding new ways to integrate and use information to create new products

This means that strong emphasis on standards and technology strategy are key elements of firm's success
- Core applications which serve multiple BUs are commonly developed and managed by the CIO. If these are also managed as separate BUs (e.g., funds transfer), the BU often reports to the CIO

Associated core operations are also managed by CIOs. In many cases (Mellon, First Chicago, \*Merrill Lynch) all IS operations are under CIO, as well as many "back office" functions
- Strong standards enable decentralization of BU-specific development responsibility. Commonly done in banking, where BUs are organized on a product line and/or market segment basis
  - BUs are close to changing needs of market/customers
  - individual systems can stand/operate alone, with straightforward integration of data

## Service-Oriented

- Varied involvement in enterprise planning
- Mixed technology strategy
- Centralized systems development roles
- Strong core operations

INPUT

Notes:

## **Service-Oriented**

- Varied involvement in enterprise plng
- Mixed technology strategy
- Centralized systems development roles
- Strong core operations

---

- Key factor in service-oriented companies is importance of information to provision of the service. This is sometimes described as "Information Intensiveness"
  - critical: transportation, medical, etc
  - moderate: retailing, etc
- Where information is critical, CIO situation parallels that of Information-oriented industries  
Examples: American Airlines/APL/American Medical Labs
  - reports to CEO
  - on managing committee, active in enterprise plng
  - strong technology strategy
  - centralized systems development and IS operations
  - some core "back office" responsibility
- Where information is moderately critical
  - organization is not as sophisticated in use of IT
  - CIO reports at lower level, is less involved in corporate planning
- Systems development and operations still centralized in "moderately critical" firms (retailing), because BUs
  - often share core systems and operations
  - lack experience to manage their own

## Product-Oriented

- Varied involvement in enterprise planning
- Varied technology strategy
- Varied systems development roles
- Varied core operations

INPUT

Notes:

## **Product-Oriented**

- Varied involvement in enterprise plng
- Varied technology strategy
- Varied systems development roles
- Varied core operations

---

- Product-oriented firms have most variety in roles
- Differences attributable to several factors
  - varying levels of Information Intensiveness, as in Service-oriented firms
  - greater variety of products/markets than with Information- or Service-oriented businesses
  - more decentralized organization structures
  - greater variety of corporate cultures
  - greater diversity of CEO styles/whims
- As with Service-oriented firms, where information is critical, CIO situation has parallels with Information-oriented industries  
Examples: Rockwell
  - high level reporting, but not direct to CEO-level
  - strong technology standards
  - mixed development responsibility (BUs do their own)
  - large centralized operations
    - . datacenters (equivalent of 35 3090-200)
    - . communications networks (equivalent of 61 T-1)
- Several industry-specific reasons for Rockwell pattern
  - economics of need for massive computation power by most BUs (Crays, etc)
  - significant exchange of technical information between BUs
  - massive exchange of technical information between firm and its customers/suppliers
- At other extreme are highly decentralized firms in which CIO has no line role at all  
Examples: Sun/Pepsico
  - reports to CEO level
  - on managing committee, active in enterprise plng
  - strong technology strategy
  - decentralized centralized systems development and IS operations

## Other Factors

- Technology level of product
- Corporate culture

INPUT

Notes:

## Other Factors

- Technology level of product
- Corporate culture

---

- Corporate culture and sophistication of production technology determine how well firm uses IT as a competitive tool
- Where product/industry has high technology content (aerospace), IT use is strong
- Where product is simple/commodity, IT use is less sophisticated/extensive (Brunswick)
- Some firms have aggressive culture and are constantly on leading edge of systems and technology. These firms view IT as a strong competitive weapon within their industry and have strong IS capabilities  
Examples: POS applications in retailing  
EDI applications in retailing/manufacturing  
CAD/CAM/CIM applications in manufacturing
- Other firms in the same industries which are less aggressive and not on leading edge are often losing potential competitive advantage
- Where IT use is strong, CIO
  - is at top level of company
  - participates actively in enterprise planning
  - has strong technology strategy
- Where IT use is not strong, CIO
  - reports at lower level
  - is not active in planning
  - has weak technology strategy

# Key Business Trends

- Globalization
- Specialization/Integration
- Pace of change

INPUT

Notes:

## Key Business Trends

- Globalization
- Specialization/Integration
- Pace of change

---

"Now let's turn to the key business trends that will affect firms over the next decade. Since one of the key roles of a CIO should be enterprise planning (even if it is not today), these trends are significant to the CIO"

- Globalization affects everyone
  - global sourcing is increasingly important for everything: financing/services/products
  - foreign competitors are entering our markets
  - our markets are expanding worldwide
- Businesses are becoming less monolithic, more focussed and specialized in specific
  - products/services
  - market niches

This often involves splitting a firm up into a larger number of smaller pieces
- Integration of business activities is increasing
  - horizontal and vertical; intra- and inter-company
  - flexible arrangements between firms (alliances, project teams, temporary or permanent)
  - EDI
  - strategic inter-organizational systems (American Hospital Supply)
- Pace of change is constantly increasing
  - technology
  - deregulation
  - products/markets
  - organizational structures/arrangements
- Breadth/complexity of individual company's output also increasing as products/services become multi-faceted
  - products with increased service/information content
  - services with increased information content
- Key issue for CIO is how to maximize the organization's flexibility/responsiveness to this changing environment
  - create/change products/services
  - merge/divest operations
  - increase strategic linkages with business partners

# Impact of Business Trends

- Information-oriented firms
- Service-oriented firms
- Product-oriented firms

INPUT

Notes:

## **Impact of Business Trends**

- Information-oriented firms
- Service-oriented firms
- Product-oriented firms

---

- Information-oriented firms strongly affected by globalization and pace of change
  - market structure and competitors constantly changing
  - new products/services constantly being introduced
  - deregulation and bank/thrift failures spurring trend of mergers/acquisitions in financial services area
  - telecommunications becoming increasingly critical for delivering information, spurred both by technology and deregulation
- Service-oriented firms affected more equally by all 3
  - same basic factors as Information-oriented firms
  - more opportunity for developing specialization in single existing service function, as well as integrating that function into other firms' business operations (e.g., Federal Express)
- Product-oriented firms strongly affected by all business trends
  - globalization affects both sources and markets more strongly than for Information- and Service-oriented firms
  - specialization becoming increasingly important, in part enabled by manufacturing technology
  - pace of change very rapid, stimulated by changes in
    - . availability of new information and service support capabilities in marketplace
    - . technology as applied to product manufacturing process embedded in product
- Trend towards development and acceptance of industry standards is key facilitating element in all these changes

# Technology Trends

- Not a driving force
- Evolutionary vs. revolutionary
- Three phases of technology application
  - Comparative advantage
  - Comparative parity
  - Comparative necessity

INPUT

Notes:

## **Technology Trends**

- Not a driving force
- Evolutionary vs. revolutionary
- Three phases of technology application
  - comparative advantage
  - comparative parity
  - comparative necessity

---

- Study identified a wide variety of new technologies as having potential application in nearly all industries
- > HOWEVER, nearly all CIOs indicated that technology trends are not a driving force in their company.
  - Technology development proceeds independently and ahead of business need
  - Little demand pull by business need as stimulus for specific technology development
  - Few situations in which technology constraints are a stumbling block in the way of corporate objectives
- > biggest problem is how to harness existing and future technology in an effective manner
  - . planning to ensure flexibility of choice
  - . standards to allow linking of multiple and disparate systems and technologies
- Most technology is evolutionary, not revolutionary
  - cheaper/better faster vs entire new capability
- Evolutionary technology development is predictable, and provides opportunity for performing old functions in
  - new ways
  - more cost effective ways
- Justification for application of new technologies shifts over time, from providing opportunity to keeping up with the competition
  - comparative advantage
  - comparative parity
  - comparative necessity
- Important issue is how/when to apply new technologies to maintain appropriate competitive position, taking into consideration cost/benefit of applying technology
- CASE tools not viewed as providing significant current advantage to IS function
  - only applicable to new projects, while 60-75% of work is maintenance: "dragging the anchor"
  - affects only a small part of total life cycle
  - real interest is in finding ways to improve speed and accuracy at front end of life cycle

## Evolution of CIO Role

- Role will not disappear
- Same objectives/problems
- More focus on strategy/planning
- Less focus on systems development/operations
- Stronger focus on telecom/network

INPUT

Notes:

## **Evolution of CIO Role**

- Role will not disappear
- Same objectives/problems
- More focus on strategy/planning
- Less focus on systems development/operations
- Stronger focus on telecom/networks

---

- Role of the CIO will not disappear in the future
  - importance if IT will increase across all industries and in all areas of business
  - need for functional expertise/focus at senior management level will always exist. CIO provides that focus/expertise for IT
  - CIO role justification is similar to that of other senior management functions, such as
    - . production
    - . marketing/sales
    - . finance
    - . human relations
- Objectives and problems of position will be similar to those of today
  - job is strongly people oriented, and human nature doesn't change
  - pace of change will continue to increase, making it both harder and more critical to plan/manage IT
- Business trend towards integration, coupled with more rapid pace of technology change, will make technology planning and strategy more important. This will raise their level of visibility as corporate issues requiring focussed strategic management
- Decreased cost (reduced economies of scale) and increased "user friendliness" of IT resources will continue trend towards decentralizing both resources and responsibilities to Bus Units.

----> Increased decentralization is also consistent with CIO objective of getting Bus Units more actively involved in their own IT functions

- Decentralization trend will also increase the need for strategic focus on planning and technology strategy
- Trend towards increasing use of communications (both internally and externally) implies a "network view" of the corporation. Emphasis will shift from economies of scale in centralized data processing to economies of scale and requirements for control of large networks

## Implications for Computer Utility

- Some opportunities, particularly in less information intensive companies
- Decentralizing provides opportunities in business units
- "Compute Utilities" may have to operate within the framework of the corporate network

INPUT

Notes:





## IV. Technology Issues

INPUT

Notes:

# Technology Impacts

- New Platforms/Devices
  - AS/400, PS/2, Parallel Processors, Supercomputers
- Networking/LANs
- Improved Resources
  - Memory, Storage, MIPS
- On-Line Transaction Processing

INPUT

## NOTES:

- The greater variety of platforms available makes selection, implementation, and management much more difficult.
- In addition, new methods of linkage and improvements in storage are developing rapidly.
- Medium/large and backward organizations can make tragic mistakes (one company INPUT knows nearly went out of business because of a computer technology error).
- As systems move into on-line, real-time mode, errors can be compounded.
- This provides an opportunity for risk avoidance selling of the "computer utility" concept.

II88-DW2-4a

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IN

## "Blurring" of Offerings Reflects *Changing Market Structure*

### New Technologies Will Create Additional Changes

- Image Processing
- Integrated Voice/Data
- High-Performance Digital Communications
- Object-Oriented Programming
- Personal Systems (IWS) Power

INPUT

#### NOTES:

- These "new" and enhanced technologies scare many users. They are new and so risky; but, in some cases so competitively important (e.g., image processing) that they must use them.
- Again, these provide opportunities for "computer utility" vendors who use these technologies and can offer risk avoidance and competitive protection.
- However, price performance improvements force computer utility and FM/SO vendors to constantly adjust prices downwards for the computer processing, storage, and transmission of information.

MPRE89-8a,b

INPUT

## User Needs

- Application Sophistication
- Heterogeneous Hardware/Environment
- Dynamic Connectivity/Cooperative Processing
- Resource Sharing/Groupware
- Productivity: User and Programming
- Workstation Support
- Image Processing

INPUT

### NOTES:

- User needs in software are becoming much more sophisticated. Their applications must be built on state-of-the-art systems capabilities.
- These are not just "plugged-in." They are difficult to achieve and require considerable expertise.
- It is support for such platforms that the computer/communications utility can provide effectively and economically.

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INP

# Software Issues

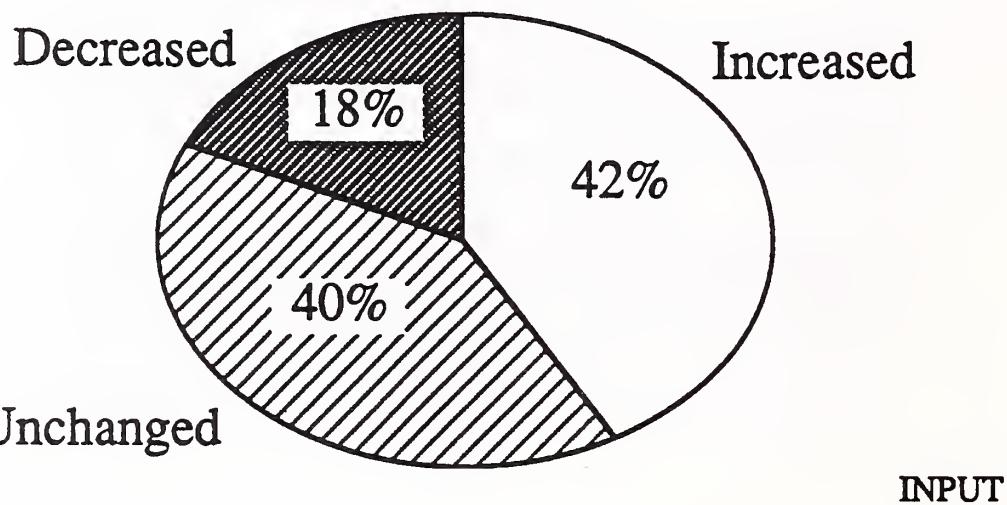
- Applications backlog continues to grow
- CASE is not the solution
- People scarcity is increasing problem
- KBS offer some potential for relief

INPUT

## Notes:

- The applications backlog continues to grow at all levels of the organization.
- CASE technologies by themselves are not the solution; they do help, however.
- The changing U.S. workforce and the increasing scarcity of skilled people will have a dramatic impact on the supply side of the industry.
- Knowledge Based Systems will help professional and end-user applications development.
- These tendencies will tend to "outsource" the development process which secondarily will lead to more systems operations opportunities.

## Application Development—Backlog 1987 versus 1988 Budget & Issue Survey



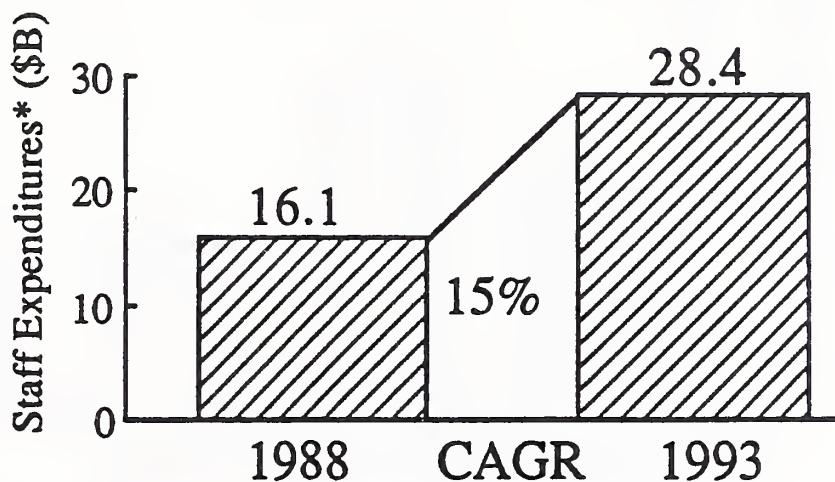
NOTES:

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INF

## Network Management Expenditures in Large Companies, 1988-1993



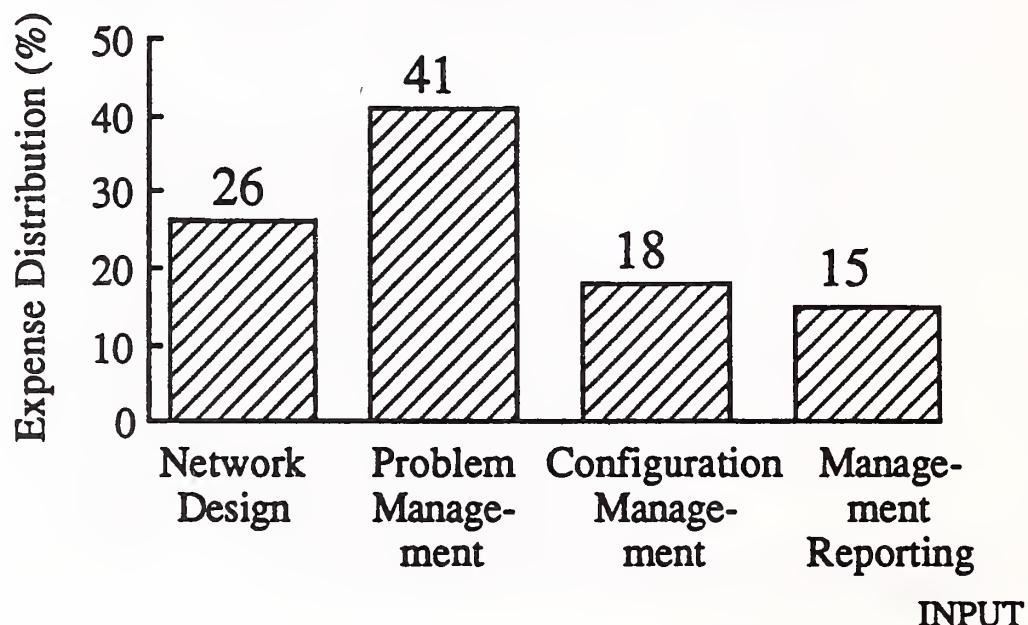
\* For companies with more than 500 employees.

INPUT

### NOTES:

- In communications, the network management (including voice and data) expenditures continue to climb, particularly for products.
- These expenditures can also be targets of a computer/communications utility.

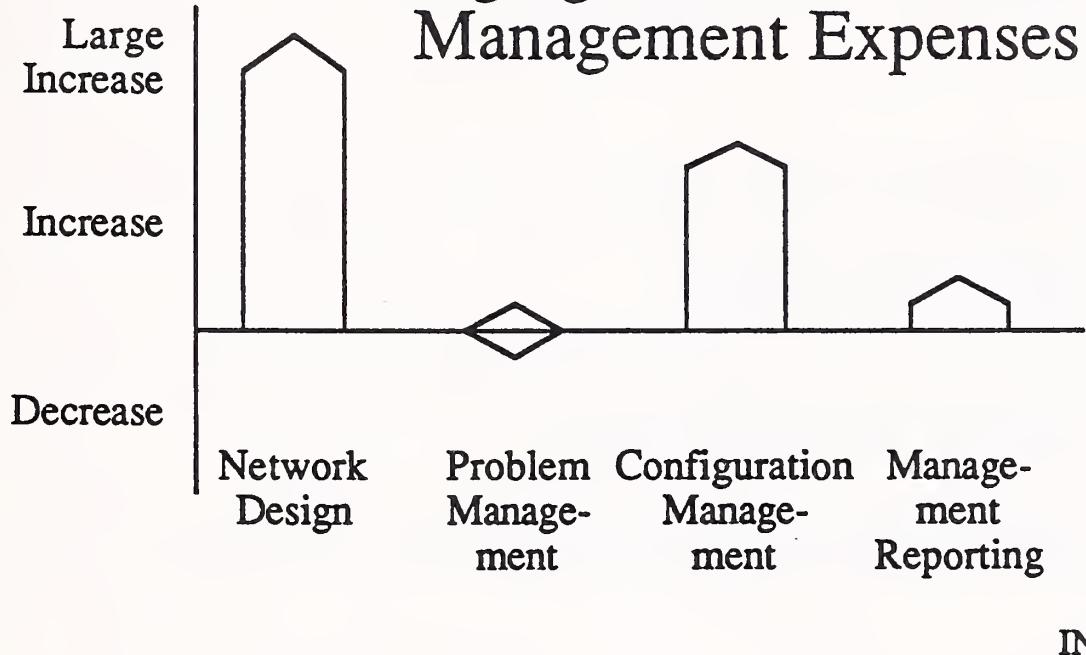
## Allocation of Network Management Expenses



### NOTES:

- Problem management is the leading expenditure category at the moment.

## Changing Pattern of Network Management Expenses



### NOTES:

- However, because of the increased pace of change and the complexity of the networks, design and configuration management are growing much faster. Current and expected processes can keep the problem management issues under control.
- While the opportunity here is probably more for communications companies, the "computer utility" should consider it.

# People

- Unpredictable need for specific resources
- Specialists needed
- Systems complexity drives needs and costs
- Lack of qualified people
- Investment needed for education/training

INPUT

## Notes:

- Changes in business needs, organization, and technology are driving the need for an increasing variety of development and operations staff. The jobs they perform are requiring ever higher skill levels.
- Again, automation is replacing semi-skilled people (computer operators) while demanding higher skills in different jobs.
- The lack of qualified people will increase, placing strains on in-house operations.
- The investment needed for on-going training and education will increase.
- These factors will tend to favor "outsourcing!"





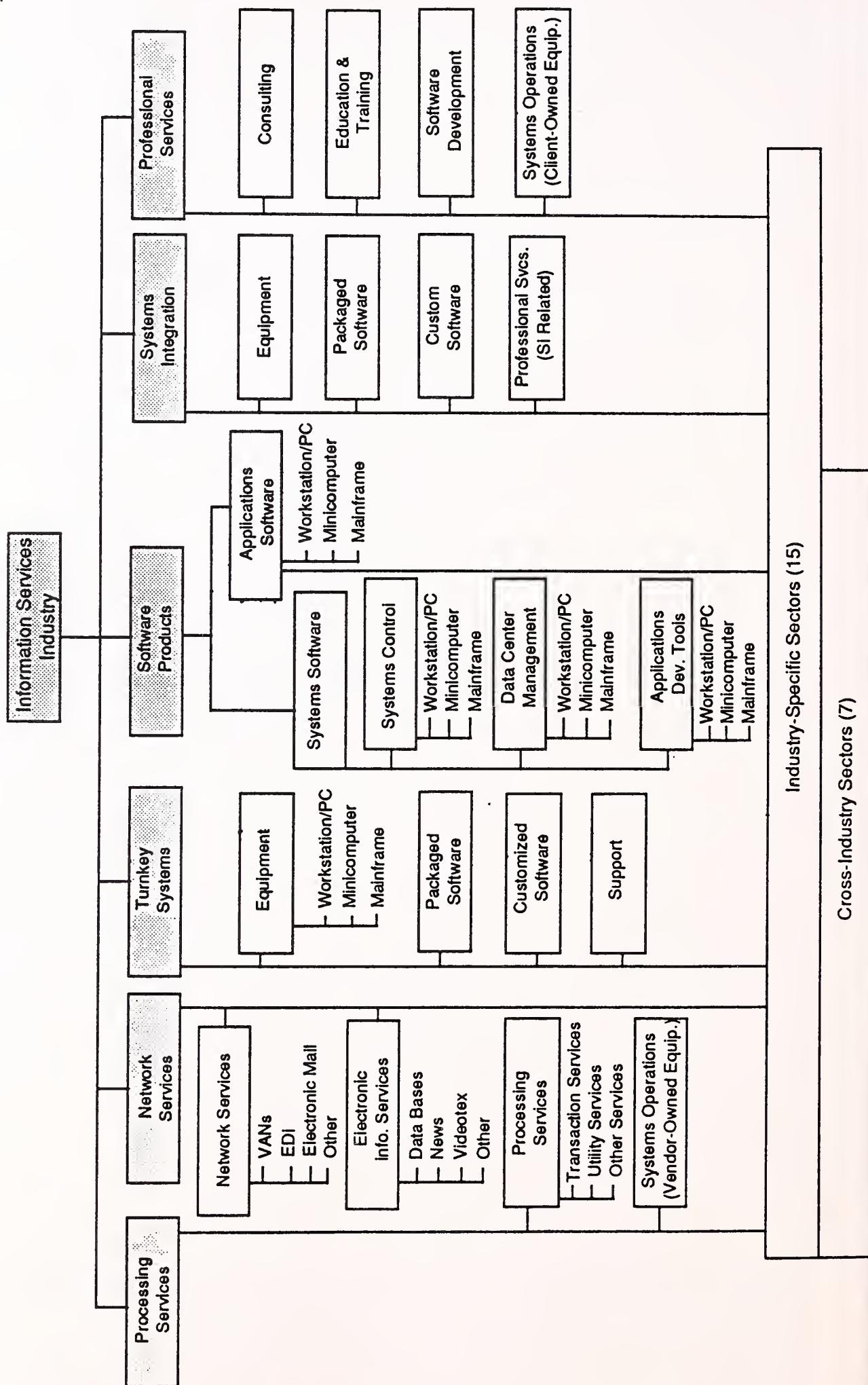
## V. Marketing Issues

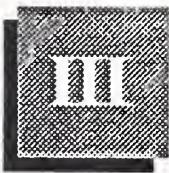
INPUT

Notes:

## EXHIBIT I-1

# INFORMATION SERVICES INDUSTRY STRUCTURE 1988





## Issues, Trends, and Events

### A

#### Processing Services

##### 1. Overview

The processing services market, approaching \$19 billion in 1988, is the largest of the individual delivery modes identified and tracked by INPUT in the information services industry. Originally combined with network services, processing services became a separate category in 1988.

Historically, processing services was the first delivery mode tracked by INPUT. Emerging in the 1960s and growing to prominence in the 1970s, the processing services sector has spawned a number of large and very successful services organizations. However, growth rates have slowed in recent years as this market matures, and INPUT now projects a relatively modest 12% growth rate for the next five years. However, it should be noted that this growth rate is still several times larger than the growth of the U.S. economy as a whole. This is a healthy market that has good revenue and profit potential for a number of current vendors.

The major trends in the processing services industry are shown in Exhibit III-1.

- The leading vendors have achieved strong positions in their selected markets. Companies like Automatic Data Processing, Electronic Data Systems, Control Data, McDonnell Douglas Information Services, and Computer Sciences have achieved significant shares of their revenues and profits from the processing services industry, while diversifying into other delivery areas as well.
- Although McDonnell Douglas encountered difficulty in 1987 and 1988 with layoffs, restructuring, and continued losses, other major vendors such as ADP and CSC report solid growth and profitability.

- As both an offensive and defensive strategy, vendors are offering their solutions to clients in an expanded delivery mix. Software products, turnkey systems, systems integration, and professional services are increasing the revenues and market positions of numerous companies.
- Large users of computer systems have moved into a vendor role by offering industry-specific and/or utility processing solutions to their suppliers, customers, or peers. Bechtel, McKesson, AMR (American Airlines), and a number of commercial banks have adopted this strategy.

## EXHIBIT III-1

### TRENDS IN PROCESSING SERVICES MARKETS

- Slowing Growth Rates
- Major Vendors Have Strong Positions
- Use of Alternate Delivery Vehicles
  - Systems Integration
  - Software Packages
  - Turnkey Systems
  - Professional Services
- Customers Become Vendors
  - Bechtel
  - McKesson
  - AMR
  - Many Banks

The continued growth of the processing services market depends on several factors, shown in Exhibit III-2. First is the trend toward outsourcing of data processing applications work. As long as large numbers of organizations are willing to off-load certain applications or processing requirements to third-party vendors, the market will remain viable. It is INPUT's conclusion that this trend will continue.

---

**EXHIBIT III-2**

## PROCESSING SERVICES ISSUES

- Outsourcing—Will It Continue?
- Impact of Super-Micros:  
Shared/Distributed Systems?
- Voice/Data Processing Opportunities
- Consumer Services—Fad or Fact

- The proliferation of super-micros, powerful workstations, and mini-computers as departmental systems will complicate the ability of IS departments and processing services vendors to deliver integrated solutions across distributed systems and data bases. Though such complications may slow the growth of "conventional" processing services, vendors that can adapt to it will gain a market advantage.
- Technology will rapidly provide combined voice/data networks (i.e., ISDN) that will change the way data communications requirements are executed. This will introduce a barrier to "business as usual" remote processing, but it can also become an opportunity for innovation.

Finally, consumer-oriented services may provide a significant economic boon for network and processing vendors. The unknown factor is the degree to which the 15 million personal computers now installed in the U.S., and the millions more to be installed in the 1990s, will be used by consumers for personal services. INPUT is confident that innovative vendors will find ways to tap this huge potential market.

## 2. Transaction Processing

Transaction-oriented processing services constitute the dominant form of processing service delivery (81% of the revenues from this delivery mode). Vendors such as ADP, EDS, First Data Resources, Shared Medical Systems, and National Data Corporation derive a large share of their revenues from such activity. (Vendor activity is discussed in detail in the following chapter.) INPUT estimates that transaction processing will continue to be the primary revenue source in this market, and that it will grow at a compound annual growth rate of 11% over the next five years.

However, entry into the transaction processing segment will not be easy. The start-up cost of processing services operations is high, and prominent vendors are entrenched. New entrants would be well advised to clearly identify specific niche markets that are not currently dominated by a major vendor.

INPUT believes that customer requirements for information services can still be satisfied via the processing services channel, provided that specific needs can be met. Exhibit III-3 lists these needs.

---

### EXHIBIT III-3

#### CUSTOMER REQUIREMENTS PROCESSING/NETWORK SERVICES

- Rapid Response to Changing Conditions
- Flexibility in Delivery Mechanisms
- Expanding Variety
- Customization
- Innovation
- Economy (within Context of These Factors)

Specifically, the more tailored, vertically oriented, and flexible solutions are the more likely to receive high levels of client acceptance, and are less vulnerable to replacement.

The transaction processing sector is characterized by the customer's willingness to off-load entire sets of applications, often those of a critical business nature. The willingness of user organizations to resist bringing these important applications on to their own in-house systems depends on the vendor's ability to perform such applications in a cost-effective and reliable manner. When the vendor can achieve this, there is strong inertia not to bring the application in-house.

### 3. Utility Processing

Utility processing is defined as the use of raw computing power and tools to develop tailored applications or solutions specific to users' personal requirements. Utility processing is primarily used in very large government engineering and manufacturing environments. The IS vendor provides access to the computer through a communications network, with software tools and consultive support to enable the user to develop and run the specific application being created. Software tools usually include compilers, DBMS, 4GLs, sorts, terminal hardware support, scientific and statistical libraries, graphics capabilities, financial modeling systems, and other application developments tools.

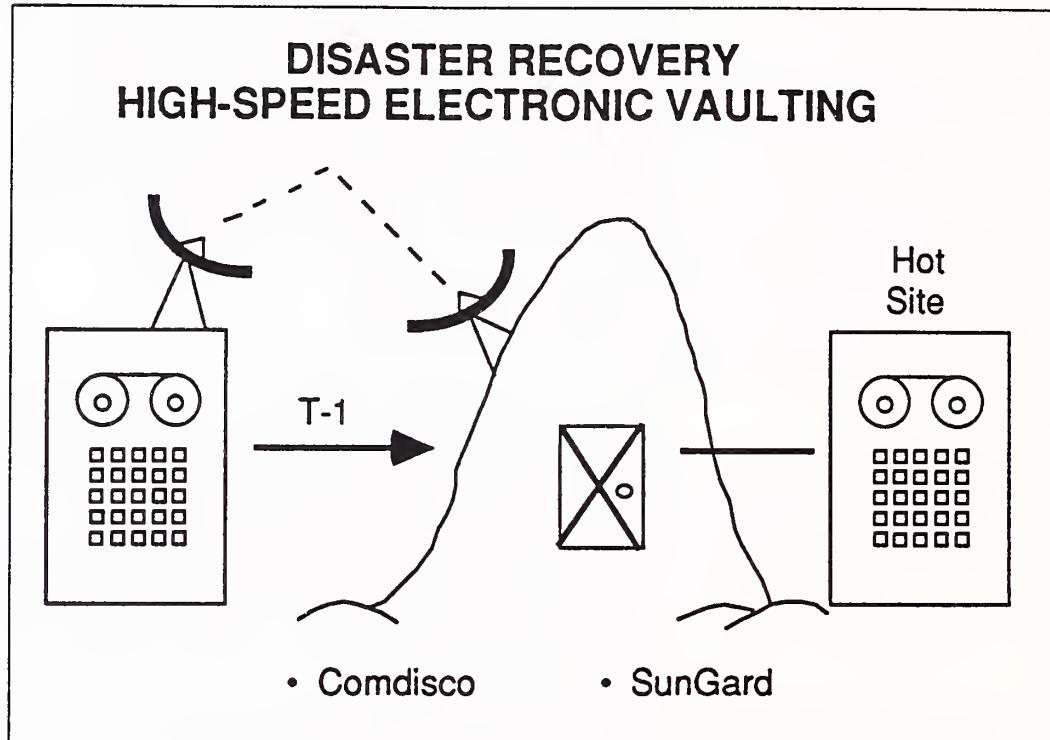
Limitations on PC processing power, memory, or disk capacity may cause end users to use utility services on an ad-hoc basis. However, the primary means of protecting revenue in this function is for astute vendors to be proactive and provide specialized software tools and consulting aids to encourage customers to use their utility processing services. Graphics, use of supercomputers, and internal IS overflow work can also contribute to revenue growth here.

Utility processing is not a business segment that vendors should casually enter at this time. It is primarily captive to existing vendors that have already invested capital in the computer hardware, communications network, and storage medium required to provide the service.

### 4. Other Processing

The "other" processing services include computer output microfilming, disaster recovery and backup services, carry-in data entry services, and off-shore data entry. This sector will be primarily fueled by the rapid growth of disaster recovery, keyed by several frightening experiences at Fortune 500 corporations (the First Interstate Bank fire in Los Angeles, for example) which made it clear that large organizations with mission-critical systems are vulnerable if they do not have such services in place. Comdisco and SunGard Data Systems have achieved strong positions in the market (see Exhibit III-4). Also, computer output microfilm services are established as a cost-effective way of storing large amounts of digitized information. Until CD/ROM or image processing disks with high

## EXHIBIT III-4



densities become more prevalent, this will continue to be a reasonable growth market. Anacomp, through acquisition, and Zytron are leading vendors of COM services.

### 5. Systems Operations (Facilities Management)

Systems operations continues to be a market dominated by a few major vendors including: EDS, Systematics, SEI, Boeing Computer Services, Mellon Bank, Martin Marietta, Shared Medical Systems, and McDonnell Douglas. The investment required to enter this market is significant, and the skills to provide this service tend to be industry specific. Market growth will primarily be channeled in specific vertical markets that have already adopted the systems operations philosophy. Traditionally the banking and finance, insurance, medical, and state and local government sectors have been most receptive to this approach, due to the combination of massive amounts of paper generation and financial limitations in staffing with large numbers of qualified people. It is difficult for clients to disengage from a systems operations approach once it has committed, so contracts and relationships tend to be long term.

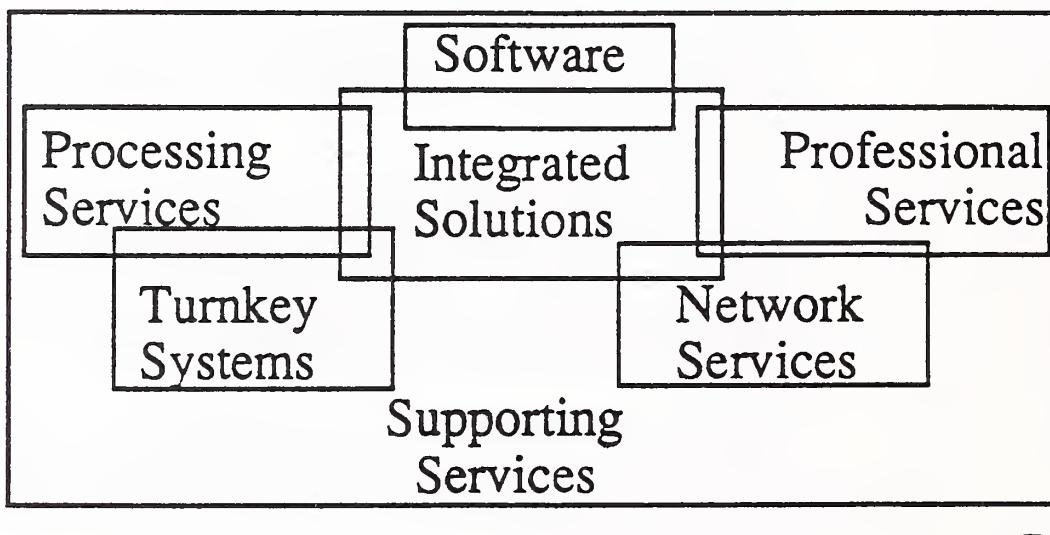
Forces driving the systems operations markets are: tight labor markets, which make retention of skilled technical staff difficult; difficulty in some sectors in paying competitive salaries for these skills; users' perceptions of the high cost of upgrading installed systems and the chance to pass the cost, at least indirectly, to a vendor; finally, the momentum provided by completion of complex systems integration projects which are candidates for systems operations contracts.

The primary trends in systems operations markets include:

- The inclusion of large network management contracts in the systems operation area, adding to the existing activity in information processing projects.
- Development of systems and applications, as well as actual operation. To some extent, this represents an overlap with systems integration markets.
- More contracts are being negotiated using a "shared resources" concept. That is, the vendor agrees to perform the work in data centers where numerous systems are linked together. The client may be unaware which machine or machines is performing the work, or even which location, but that is immaterial for the result.
- Vendors are beginning to mix equipment brands, using a variety of IBM, Digital, Amdahl, and Unisys systems based on specific needs. Previously, systems operations vendors have been IBM systems users almost exclusively.
- Vendors tend to be focused on one or two specific vertical markets where they have developed expertise, people skills, and reputations.
- Long-term contracts are more frequently negotiated, beyond a one-year term.
- Competition is high for the skilled personnel resources who can perform in a systems operations environment. In competitive bidding, losers will frequently attempt to recruit key players from the winner's staff, to hamper the winner's ability to perform.

# IS Market Structure—1990s

## *Emphasis on Supporting Services*



**NOTES:** The structure of the market is changing.

- Supporting services are becoming more important. Also the concept of information services as a support service is increasing in acceptance.
- It is why this market is growing 3 times as fast as IS budgets.
- IBM is emphasizing operations support through its NSD. This will be a major trend for all manufacturers.
- This changes the market structure and environment for the "computer utility" and SO services.

## “Old” Facilities Management

- Focus on Computer Operations

## “New” Systems Operations

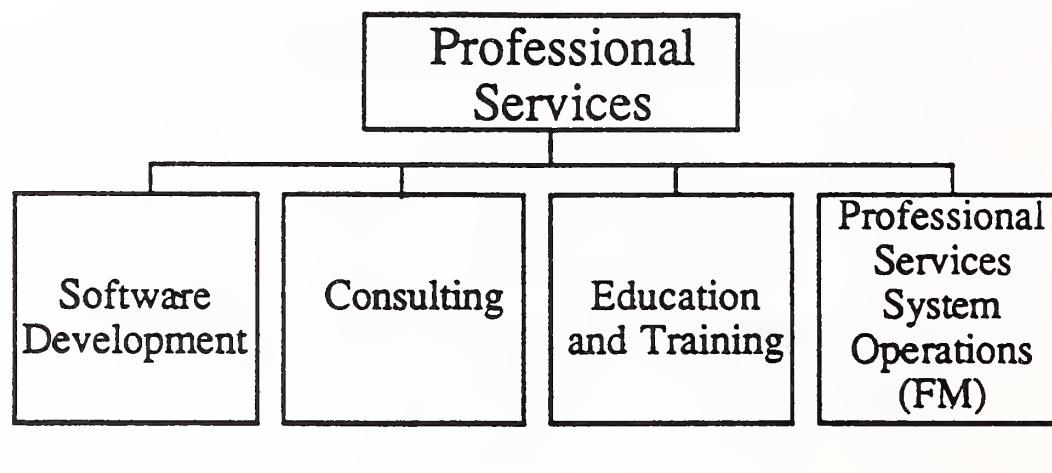
- Development, Planning, Control,  
Operations

INPUT

**NOTES:** The new term of "Systems Operations" replaces "Facilities Management;" it far more accurately describes what the customer is buying.

- Included in SO are many functions, including custom or standard applications software, built on an operations (or computer/communications utility) base.
- Thus, the computer/communications utility is a basic component of all SO processing services.

# Professional Services Market Structure



**NOTES:**

- There are two kinds of systems operations service:
- In the professional services systems operation the customer owns the systems (the equivalent of GOCO in government parlance).

## Processing Services

- Transaction Processing
- Utility Processing
- "Other" Processing
- System Operations
  - Vendor-Owned System
  - AKA "Facilities Management"

INPUT

### NOTES:

The other form of systems operations is where the vendor owns the computers (the equivalent of COCO for government contracts).

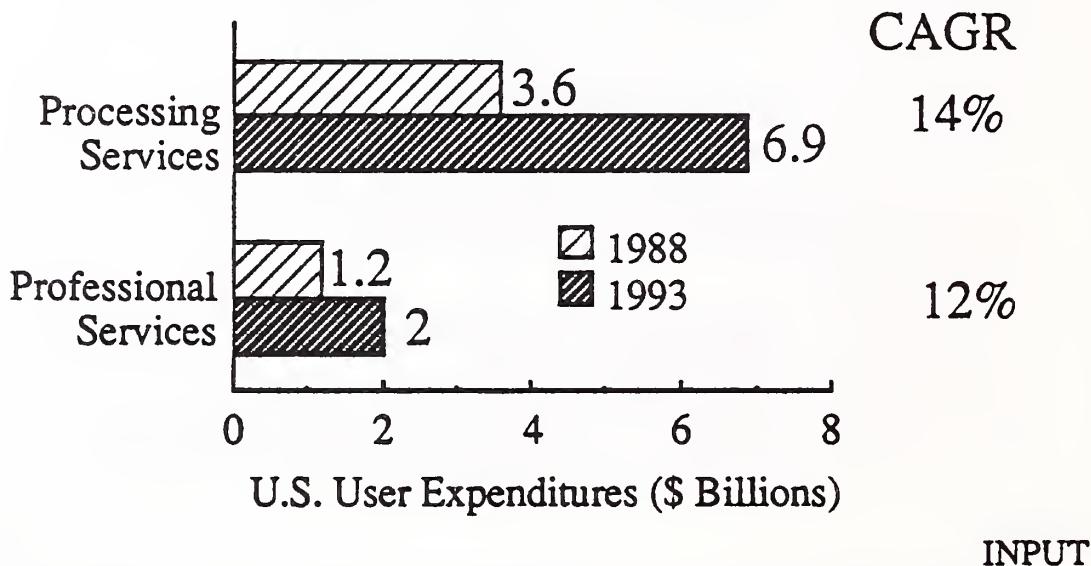
- This market includes both industry specialized SO/FM (such as offered by EDS) where the vendor often owns the applications software as well, and the cross-industry "computer utility" type of service.

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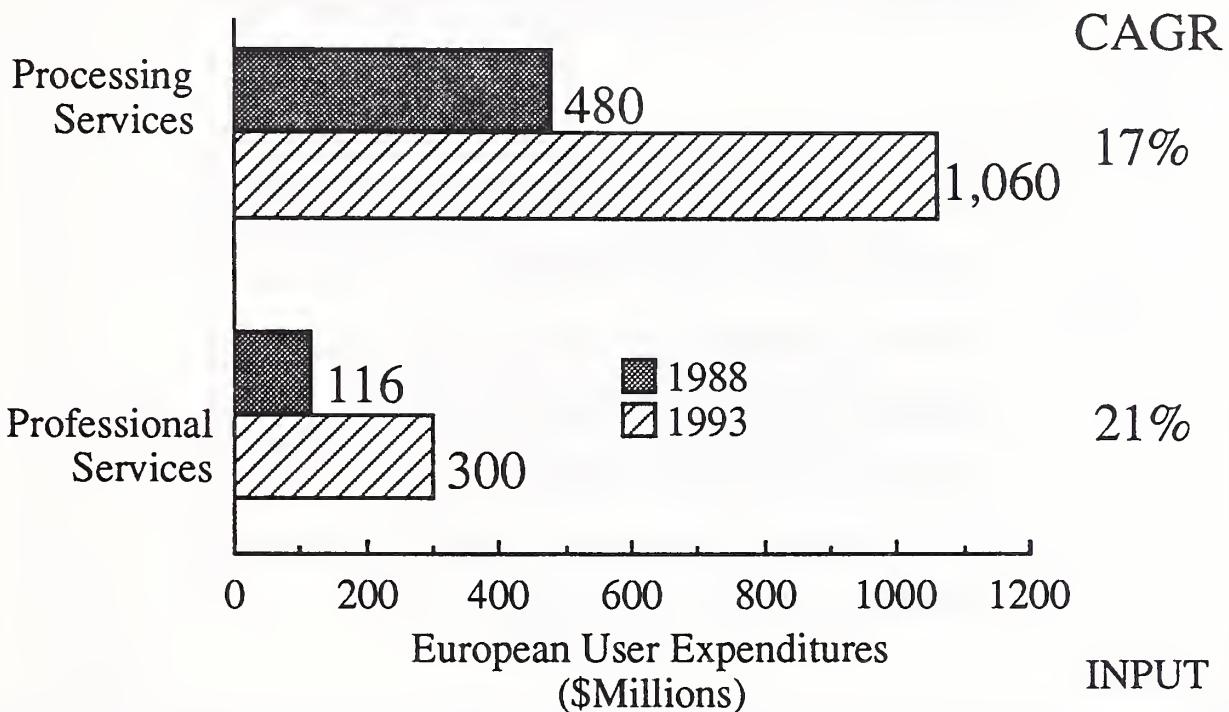
INPUT

## Systems Operations Markets 1988-1993



- **NOTE:** professional services SO growth rate is composed of two components:
  - much slower growth in traditional government GOCO contracts; faster growth in SO contracts resulting from SI contracts (the type of SO performed by Andersen Consulting).
- Indeed this growth rate will be substantially increased through the 1990s for a variety of reasons, including the completion of SI contracts.
- This could be at least a \$10 billion market in the late 1990s.
- The processing services growth rate will also accelerate, driven by IBM support services, among other factors.

## European Systems Operations Markets 1988-1993



### Notes:

- One of the reasons the growth rates are faster in Europe is that there is little established government business.
- The market in Europe is much less industry specialized than in the U.S.
- One of the other reasons for rapid growth is the increasing shortage of qualified staff to provide the specialized skills to support computer/communications operations.

# Trends in Systems Operations

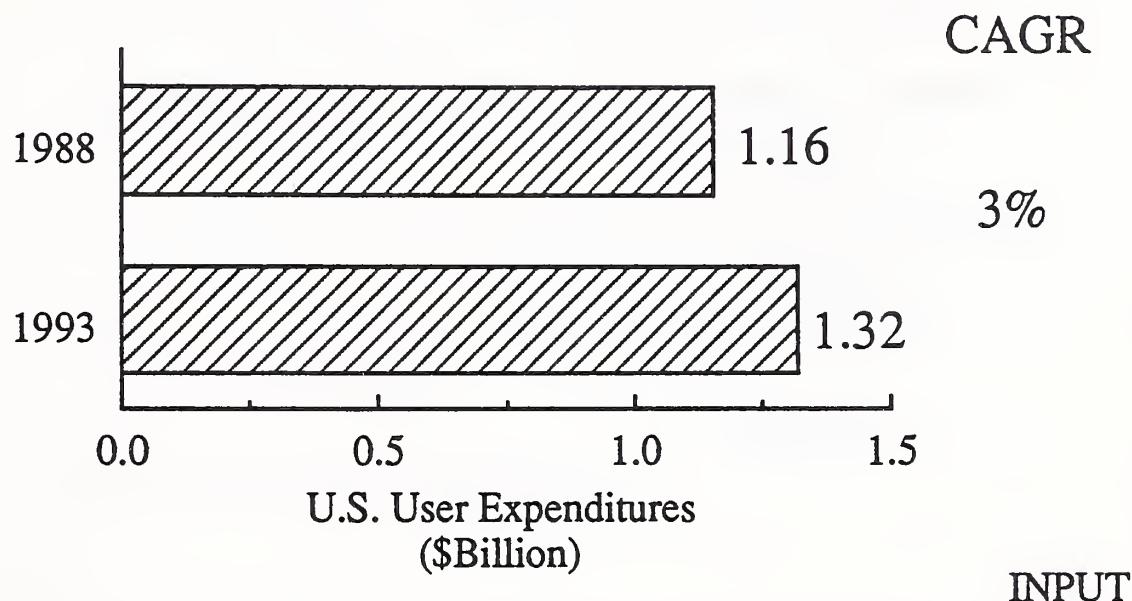
- Network Management Contracts
- Development as well as Operations Included in Agreements
- Shared Resources Approach
- Mixed Hardware Offerings
- Vertical Market Focus
- Long-Term Contracts for Processing Services

INPUT

**NOTE** These trends exhibit a broadening of the old FM concept. Networks, for example, are often a key part of contracts for services as is the provision of planning and development services.

- Shared resources where the vendor and the customer might have ownership of parts of the system are possible.
- The vertical market focus will continue even where there may be little application software "packaged" in the systems operations contracts.
- The length of term for SO contracts may be shorter than in the past for certain types of contracts. In others the term may be extended.

## Utility Processing Services Market 1988-1993



### Notes:

- Utility processing services are month-to-month contracts for use of computer facilities on a resource usage basis.
- There is an additional \$80 million per year of longer term contracts included in systems operations processing services which is forecast to grow at around 4% per year.

# Pricing

- Key pricing issues for the SO buyer are:
  - Predictability
  - Control
  - Price performance
  - "Futures"

INPUT

## Notes:

- In SO/FM contracts, buyers are buying a complete service. They are prepared to accept variations on their costs dependent on levels of service, e.g., number of customers processed, within broad steps.
- They are not prepared to be "nickled and dimed" nor for billing based on technology use as opposed to business parameters.
- They are concerned that benefits from price-performance improvements are passed on to them -- a framework for future changes is important.

## Pricing

- "Computer Utility" is usually resource priced
  - "Storage" and "Connect Time" are the areas of most danger
  - Processing unit algorithms are more protected
- Successful services provide package prices
  - "Virtual machine"
  - Real, dedicated systems

INPUT

### Notes:

- Some computer utility services, e.g., for major projects, are effectively priced on a resource basis. Customers are willing to pay a premium for services, e.g., on a "bridging" service.
- For longer term contracts, then packaging in a pricing envelope is required. In some cases, vendors will actually operate dedicated computers in their environment. This gives the customer total "ownership" of the system: he pays directly for the hardware and the software, paying only for the operation and support.

# Support

- SO/FM contracts require complete, bundled support
- "Computer Utility"/resource services can "menu price" support

INPUT

## Notes:

- In standard SO contracts, hardware, software (both systems and applications), and communications support are "bundled" into the contract.
- In "computer utility" services the initial point of contact and support provider may be a customer interface. Application support and problem determination may be their concern. The customer may also provide such systems software support as data base and communications support.
- Thus, "menu pricing" is appropriate for "computer utility" support.





## VI. Conclusions

INPUT

Notes:

## "Computer Utility" Market

- Small market for super-computer computation services
- Small, transient market for compute capability only
- All markets require other value-added parameters
  - Operational, "computer-utility"
  - Applications, FM/SO

INPUT

Notes:

## Therefore Do Not Use the Term "Computer Utility"

- "Systems utility"
- "Support services"
- "Operations support" (IBM term)
- "Systems operational services" (SOS!)
- "Computer operation services"

INPUT

### Notes:

- What the service is called is key. It reflects what you are selling and the customer is buying.
- Customers are buying the ability to operate a computer/communications system for them. The computer is like a car engine: the customer is buying the taxi service. (Perhaps FM/SO is the limousine service!)
- For problem situations, I like the SOS!

# **INPUT Opinion**

## **Key Characteristics of Target Markets and Prospect Companies**

- Industry Markets
  - Highly customized, not prone to package solutions
  - Excludes traditional FM/SO markets such as banking, insurance, hospitals
  - Volatile, rapidly changing environment  
e.g. semi-conductor manufacturing, construction
  - Strong cost pressures and systems needs
  - Restructuring, e.g. advertising

**INPUT**

### **Notes:**

Those markets which are structured and replicable in their needs will more probably be targets for full SO/FM services where packaged software is used. They are also targets for turnkey systems.

Industries which are prone to rapid change are also prospects though recognizing that there will be concomitant rapid changes in revenue streams.

Assuming savings are a critical part of a computer utility offering, then industries such as food services with intense cost pressures but increasing needs, would be targets.

# INPUT Opinion

## Key Characteristics of Target Markets and Prospect Companies

- Prospect Companies

- Expanding multi-nationals, particularly aggressive acquirers
- Troubled companies, going through turn around
- Very fast growing companies
- Companies undergoing major organizational changes, e.g. LBOs, divestiture

INPUT

### Notes:

- "Computer utility" prospects are characterized by a need to change rapidly. The need can be derived from inside or outside agencies.
- A simple change in management can be a flag (see Buyer Characteristics).
- Very fast growing companies can be in:
  - High technology industries, e.g., Apple, Compaq, ORACLE.
  - Other industries.
- "Computer utility" services can often be "bridging" services, so look for companies moving from one state to another.

# INPUT Opinion

## Key Characteristics of Target Markets and Prospect Companies

- Prospect Companies

- Companies wanting to change basic IS architecture (e.g. Honeywell to IBM)
- Companies with disparate, incompatible computer centers (use CI as source)
- Companies with major development contracts with professional services companies without operational capability
- Generally medium/large companies for domestic U.S. services and large/very large for international services

INPUT

Notes:

# INPUT Opinion

## Who is the Buyer?

- Varies greatly—dependent on prospect
- Individual more than team
- Customized marketing required

INPUT

### Notes:

- The buyer may be:
  - CIO in a rapidly changing organization looking to outsource operations.
  - Divisional managers in organizations undergoing distribution of IS responsibilities.
  - Senior International Operations executive in companies expanding internationally, e.g., gearing-up for 1993 in Europe.
  - Chief Executive of a very fast growing company of any type.
  - Investors (institutional and individual) in corporate restructuring.
- The "buyer" is less likely to be a team - it is likely to be an individual with authority. Approval may be required at CEO/Board level.

# INPUT Opinion

## What is the Buyer Looking for? Business Needs

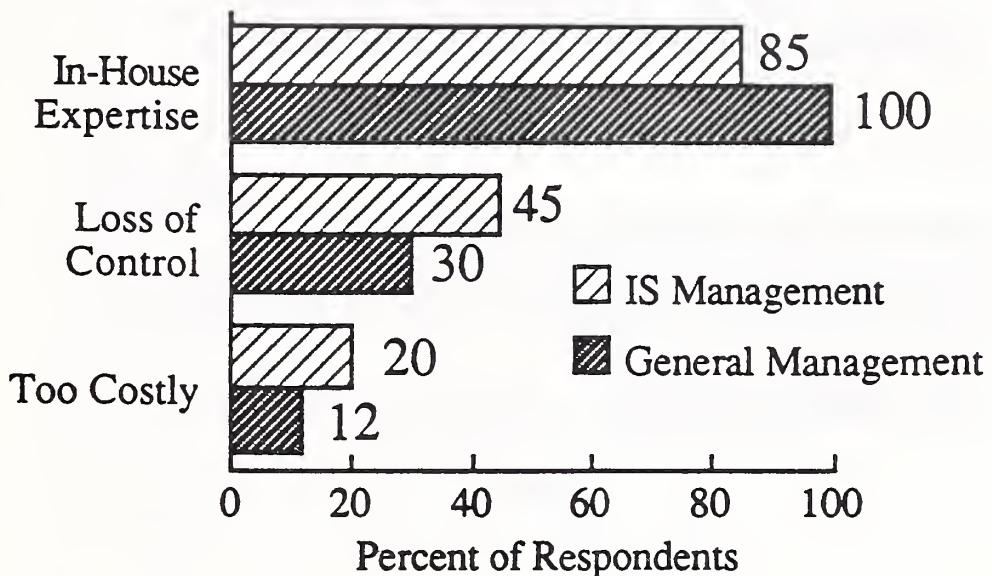
- Depends on the prospect
- Requires customized marketing

INPUT

### Notes:

- Again, this will depend on the situation.
- Probably all or some of the following:
  - Standard, transferable operating environment, almost certainly IBM compatible.
  - Predictable costs of operation.
  - Multi-location (country) services.
  - Cost reductions.
  - Removal of a headache.
  - Taking over existing operations.
  - Rationalization of services/centers.
  - Reducing staff levels.
  - Flexibility.
- Again, the marketing program will be highly customized.

## Subcontracting Resistance



INPUT

### NOTES:

- This chart is from a typical INPUT survey.
- It shows that resistance to subcontracting an IS activity is primarily due to the organization perceiving it has the in-house expertise. If this cracks, then subcontracting is far more likely because other factors are relatively unimportant.
- Note that senior management (who is paying for it) often thinks its IS organization has more expertise than the IS manager believes.
- This is why the CIO/IS manager can be an ally in purchasing "computer utility"/SO services.

## **INPUT Opinion**

### **What are the Buyer's Key Motivators?**

- Most often, solving a problem
- Reducing risk and time often important
- Scarcity of people

**INPUT**

#### **Notes:**

- Often the buyer will be coming from a negative position for an existing operation. The vendor will be solving a problem.
- For a new operation, the buyer would be looking for time savings more than cost reduction, e.g., establishing brand new operational center in Europe.
- Risk reduction will be a prime motivator in all cases.
- In all cases, the buyer will want to have controllable costs. In many cases actual cost reduction will be necessary.
- Often the buyer will lack appropriate operational expertise.

## INPUT Opinion

### Essential Service Requirements

- Computer, communications, software and people package
- Complete, up-to-date operation using accepted standards
- Varied detailed support requirements
- Simple, accurate billing

INPUT

#### Notes:

- Highest levels of operations capability will be required:
  - 7 day/24 hour per day operations.
  - Rapid response time.
  - Effective problem identification and resolution.
- Other probable requirements:
  - Latest IBM systems software capability.
  - Disaster recovery/back-up services.
  - Standard network/computer operations environment (so customer is not locked in).
  - Support for distributed/cooperative processing.
  - Conversion/implementation services.
  - Logistics management of hardware/software/communication units.

## **INPUT Opinion**

### **Key Packing, Pricing and Contractual Characteristics**

- Resource use pricing difficult
- Price-packaging required
- Flexible period of contract
- Charge for value-added support
- Customized contracts

**INPUT**

#### **Notes:**

- Because of obvious "mark-ups," resource use pricing is difficult. Storage and connect charges are most sensitive. Also, resource use pricing results in unpredictable bills; customers do not like that.
- Some form of price/service packaging is required, built around specified levels of effort.
- The period of the contract must be flexible, particularly for "bridging" contracts.
- All the value-added support services should be charged: "hotline," logistics management, disaster recovery, consulting, conversion, etc. In essence, drive down the basic operations charges and charge for the value-added.
- Contracts will be customized. Clear approval processes and bid maintenance will be required.

## INPUT Opinion

### Prospect View of System Utility Relationship

- "Technology" rather than "application" solution which is SO/FM
- View could be
  - Short term, solve a problem
  - Long term, provide basic architecture
- Access to senior management will vary

INPUT

#### Notes:

- Generally the prospect will view the relationship as providing a technology/platform service rather than an applications solution. This will be the main difference from SO/FM.
- Incidentally, this view may provide more scope for service since the vendor is insulated somewhat from the issue of customer competition.
- If the reason for using the service is to solve a problem, then the relationship will be viewed as transient. This could be extended by performance to a long term strategic "partnership" which is the objective. This view could particularly be held in the multinational environment, for example.
- Access to senior management will vary. Initially it might be purchased at a lower level; then there should be the opportunity to move up and laterally into business units. In many situations it will initially be purchased/reviewed at the highest level.

## **INPUT Opinion**

### **Prospect View of System Utility Relationship**

- Account control will vary
  - Strong for technology
  - Medium to weak for applications
  - Varied for people
- Competition for other IT services will be strongly affected

**INPUT**

#### **Notes:**

- Account control depends on what is being controlled. Anything related to the computer/communications center will be almost absolute: anything related to cooperative/distributive centers should be strong. Application products and services control will vary depending on their relationship with the basic "utility" services. This will also apply to consultants and other service people.
- This service will, however, provide the opportunity for the vendor to be "inside" on applications and other activities outside the "system utility." Therefore, indirect account control should grow with time, good service, and effective "sales" in a "soft" manner.
- Thus, competition for all services will be strongly affected over time, either directly or indirectly.

# **INPUT Opinion**

## **Prospect View of System Utility Relationship**

- Should become stronger over time
- Opportunity for service expansion

**INPUT**

### **Notes:**

- With good service the scope of the relationship should constantly evolve into:
  - Other business units.
  - Applications.
  - Other services, such as voice communications.
- Vendors should view the system utility as the "Trojan Horse" -- once inside the customer, the opportunities to expand in a protected manner are boundless.
- However, the "strong sell" should be avoided: the concept of "partnership" emphasized.

# Computer Utility Partnering Opportunity

- Could be key motivator
  - Compute utility/operational capability
  - Vendor application/industry capability

INPUT

## Notes:

- This is the major threat from IBM. They will provide the platform and network base while another vendor provides the industry/application software, support, and service.
- This allows IBM to penetrate many markets at the same time.
- EDS could also adopt this strategy in industries that are outside its prime targets.

## "Systems Utility" Impact on the Market

- Forecasts are without major market entry
  - IBM
  - EDS
  - Andersen Consulting
  - AT&T
- Entry of major player/s
  - Changes existing markets
  - Changes other markets

INPUT

### Notes:

- The "computer utility" was a concept developed by Parkinson in 1968. Its analogue was the electric power utility, but there were no equivalent devices to use the computer utility power -- now there are with PCs and workstations.
- In the meantime, companies are offering resources on a utility basis without much promotion/sales activity. These are often companies with investment in computer/communications facilities for their own use.
- Aggressive entry by major player/s changes the markets. Why should everyone have their own "power station?"

## **INPUT Opinion**

### **Impact on EDS Market**

- Pricing

- Probably all FM/SO contracts should be based on computer utility pricing
- Build portfolio of charges on top
- Existing business must show price declines for operational activities for equivalent efforts

**INPUT**

Notes:

## **INPUT Opinion**

### **Impact on EDS Market**

- Competition
  - EDS should be worried about existing contracts as well as new
  - IBM would like nothing better than to penetrate a GM account with operations support services
  - Therefore EDS must act now

**INPUT**

Notes:

# INPUT Opinion

## Impact on Existing EDS Market

- "Traditional" FM/SO markets could be attacked by combination of:
  - Computer utility
  - Application/industry specialist software/service

INPUT

### Notes:

- This may in fact be happening today from IBM in particular since IBM is emphasizing its Business Partner relationships.
- Difficulty for EDS is that buyers may compare EDS charges with the operations support charges from IBM.
- This opens up the pricing discussion.

## **INPUT Opinion**

### **Impact on EDS Market**

- Impact of competitive pricing
  - INPUT considers 10% price differentials important in initial vendor selection
  - 25% price differentials cause vendor replacement

**INPUT**

Notes:

## **INPUT Opinion**

### **Impact on EDS Market**

- "Playing fields"
  - They will not be even
  - IBM and Andersen will be selling different services from EDS
  - Vendor perception is key

**INPUT**

Notes:

# INPUT Opinion

## Impact on EDS Market

"It's better to eat your own children than have someone else do it."

INPUT

### Notes:

- Many companies have fought to protect established markets because of their entrenched thinking and inertia, when outside forces have changed their marketplace. (IBM and GEISCO are classic examples.) This may be happening in systems operations because of the strategies of IBM, Andersen Consulting, ORACLE, and other vendors, not to mention changes in buyer needs.
- If so, EDS must "bite the bullet" itself and attack its own business. Tom Peters and Michael Porter would approve!

*See DRAFT for Sept. 27*

## "Systems Utility" Market Potential

- Vast-unmeasurable
- Replaces in-house data/network centers
- Attractive features:
  - Avoids equipment upgrade/choices
  - Avoids software (operating systems/DBMS/communications) upgrade/operations problems
  - Avoids systems staffing needs and problems
  - Avoids maintenance problems

INPUT

### Notes:

- IBM has said that operations support is a \$100 billion per year market. Add to that equipment communication and software purchases which can be included in a utility approach. This gives at least a \$200 billion potential.
- Realistically, small and single site companies are not prospects. Neither are the super large companies.
- A market potential of \$50 billion in the U.S. is a reasonable estimate.

## "Systems Utility" Market Potential

- Increasingly data/network centers are 'operatorless'
- Can be moved, taken over without users noticing
- INPUT always considered major opportunity

INPUT

### Notes:

- A data center can increasingly be taken over without users noticing since all interfaces are over a communications line: development, operations, support, etc.
- Data centers are nodes on the network, so why should users still have their own? Buy them as part of the network.
- INPUT has always considered this was the real opportunity for AT&T.

## "Systems Utility" Market Potential

- Questions
  - To what extent will IBM impact its own business?
  - Can anyone else impact the market as well?

INPUT

### Notes:

- IBM is unlikely to get fully behind this concept in the near term. It is too revolutionary.
- A problem with IBM's entry would be its limitation on the types of platforms used. This would be a negative for many prospects.

# "Systems Utility" Market Potential

- Issues to be addressed:
  - Ownership
  - Control
  - Security
  - Competitiveness
  - People

INPUT

## Notes:

- There are logical reasons why many objections in these areas can be overcome. More importantly, however, are the emotional blocks that will have to be addressed.
- For example, it could be shown that CIOs would have more control and security through using a "systems utility" than using their own data centers. However, they may not be emotionally prepared to accept this.

# Conclusion

- EDS must examine implications of "systems utility" carefully
- Potential very large market
- Could decimate its basic business if others are successful

INPUT

## Notes:

- The computer utility services as presently offered are not an exciting market. The "systems utility" market with an attack by one or more of the major vendors could be the market of the late 1990s.
- EDS must examine it from a defensive and aggressive viewpoint.



